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Cabralis gloriosus Navas of Soutpanberg Mountains (Limpopo, South Africa) (*Neuroptera, Psychopsidae*)

Muhabbet Kemal Ahmet Ömer Koçak

Abstract: *Cabralis gloriosus* Navas of Soutpanberg Mountains (Limpopo, South Africa) (*Neuroptera, Psychopsidae Cesa News* 62: 1-3, 1 fig., 1 map.
Occurence of *Cabralis gloriosus* in two localities of Western Soutpansberg Mountains are reported. Behaviour of the adult is also mentioned.
Keywords: *Cabralis gloriosus, Psychopsidae, Neuroptera,* Soutpansberg, Limpopo, South Africa, fauna.

Psychopsidae family is one of the little known neuropterid group, restricted in Central and South Africa, South East Asia, and Australia. Recently, a new genus and a new species (fossil) were discovered in the laminated limestone from NE Brazil (Martins-Neto & Rodrigues,2010). Living african members of the family have been reviewed by Tjeder (1960) in details. Currently known five species of the family in South Africa belong to three genera, i.e., *Silveira* Navas,1912 (3 spp.), *Notopsychops* Tillyard,1919 (1 sp.), and *Cabralis* Navas,1912 (1 sp.). During our visits to Soutpansberg Mountains in 2003, we observed populations of a very rare species, *Cabralis glorious* in two different places. Following brief notes are related with this species, its occurence and behaviour.

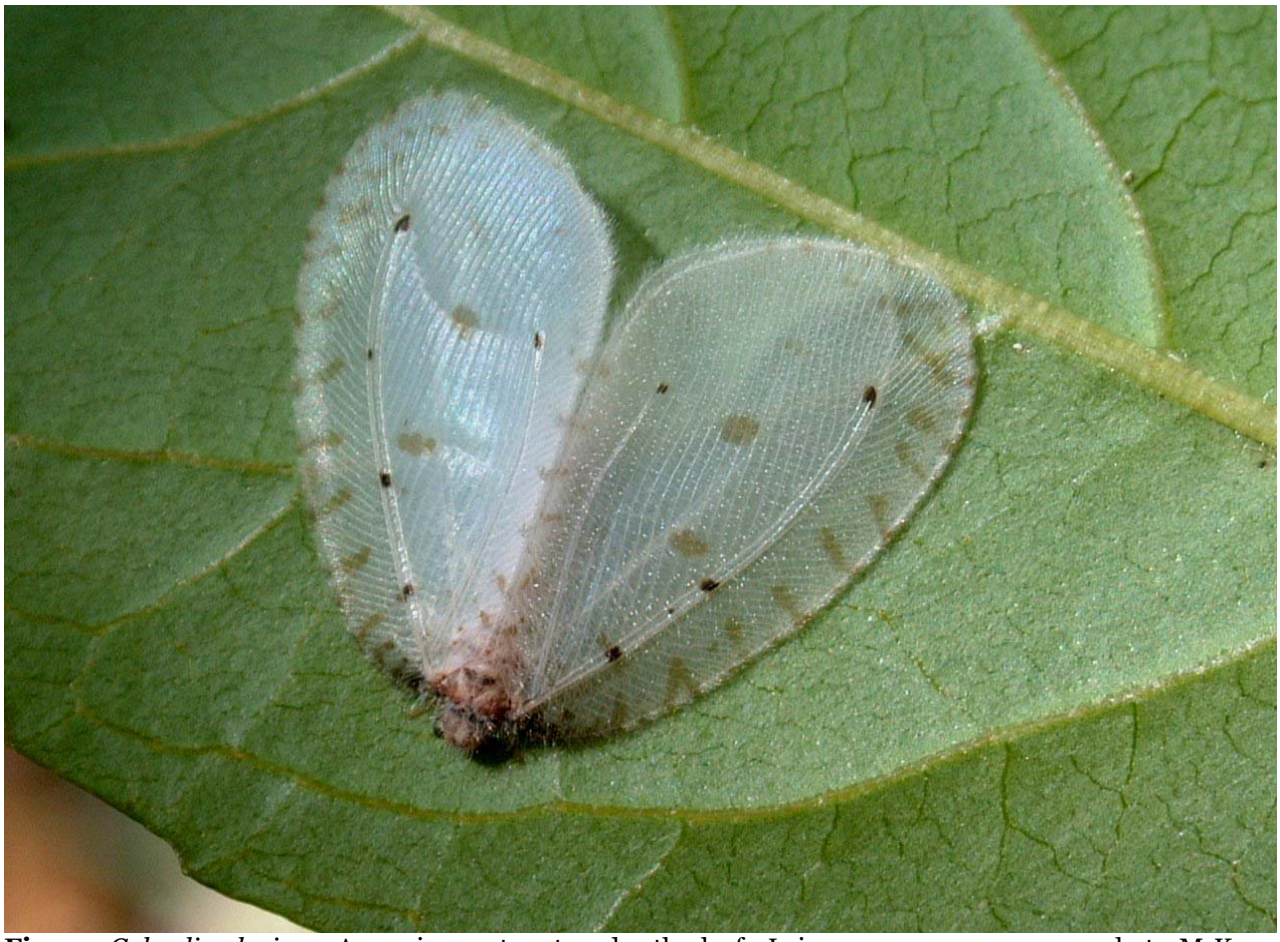
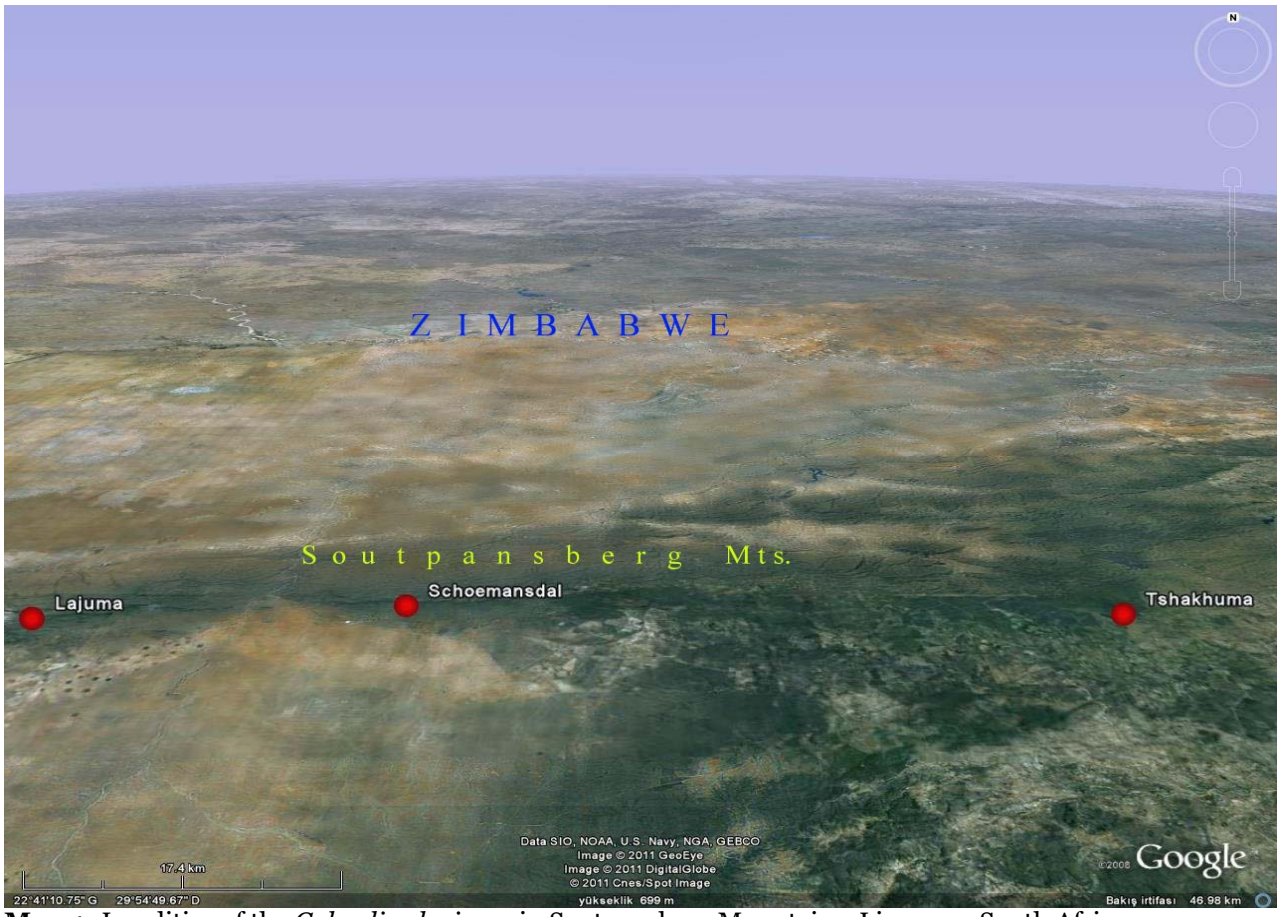


Fig. 1 - *Cabralis glorious*. A specimen at rest under the leaf., Lajuma 1300m, 3 12 2003 photo M Kemal (Cesa)

This species was previously collected by Van Son in November 1931 at "Tshakoma" [correct Tshakhuma, west of Entabeni State Forest] in East Soutpansberg Mountains. The material is preserved in Transvaal Museum (Pretoria) (Tjeder,1960: 203). This was the sole record of this species in the Republic of South Africa. The species was originally described by Navas (1912) from Beira (Mozambique), and later recorded also in Zimbabwe (Umtali district, and Shirinda) (Tjeder,1960: 203-204). Our records are from western Soutpansberg Mountains, Schoemansdal (January, 1000m), and Lajuma (December, 1300m). The specimens were observed during flying at the upper slopes of Schoemansdal, inside of dark forest. The specimens were obviously sciophil and their flight very slow and weak. At Lajuma, two specimens were seen at light by night. Evidently, they were also attracted by light like moths.
Cabralis glorious is known only from Soutpansberg Mountains (3 localities) in South Africa (see Google map). This species is apparently confined to Soutpansberg, where is the south-westermost location of its range.
Flight of the adult: November (Tshakhuma), December (Lajuma), January (Schoemansdal).
Altitude: 680-1300m.
Studied Material: Totally 11 specimens (7 from Schoemansdal, 4 from Lajuma) are currently preserved in the collection of the Cesa.



Map 1- Localities of the *Cabralis gloriosus* in Soutpansberg Mountains, Limpopo, South Africa.

Acknowledgement: We sincerely thank to the family Underhay at Medike, and Prof. Dr. (Lajuma) for their kind helps and supports during our visits in 2003 and 2004.

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Tjeder, B., 1960, Neuroptera-Planipennia. The Lace-wings of Southern Africa. 3. Family Psychopsidae. pp. 164-209, figs. [in] B. Hanström, P. Brinck and G. Rudebec (eds.), *South African Animal Life*, Vol. 7. Swedish Natural Science Research Council, Stockholm.

Smicromyrme atropos (Smith) from Soutpansberg Mountains (Limpopo, South Africa) (*Hymenotera, Mutillidae*)

Muhabbet Kemal Ahmet Ömer Koçak

Abstract: *Smicromyrme atropos* (Smith) from Soutpansberg Mountains (Limpopo, South Africa) (*Hymenotera, Mutillidae*). Cesa News 62: 4-5, 1 fig., 1 map.
Occurence in Soutpansberg and the identity of *Smicromyrme atropos* (Smith) are briefly discussed.
Key words: *Smicromyrme atropos, Mutillidae, Hymenotera,* South Africa, Limpopo, Soutpansberg Mts.

"*Mutilla atropos*" was originally described by Smith (1855) from Port Natal [South Africa] and later the species was transferred subjectively to the genus *Smicromyrme* Thomson,1870 (Opusc. ent. 2: 208) (Type-species: *rufipes* Fabricius,1787). This species was also described as "*Mutilla albistyla*" from Pretoria by Saussure in Distant's publication entitled "*Naturalist in Transvaal*, 1892, p. 225, pl.4 fig.7). The name *albistyla* is considered by Bischoff (1920) as a subspecies of "*Smicromyrme atropos",* ranging from Transvaal to the northern African countries (Mozambique, Zaire, Tanzania, etc.). Although this group needs an urgent revision in Africa (Lelej, pers. comm.), the present specimen, obtained from Soutpansberg Mountains **(fig.1)** is acceptable as *Smicromyrme atropos* with the provisional subspecific identification as ssp. *albistyla* Sauss.

Fig. 1- *Smicromyrme atropos (Mutillidae)*. South Africa, Soutpansberg Mts., Medike 820m 22 11 2003, captured at light trap M.Kemal & A.Koçak leg., det. A.S.Lelej, photo M Kemal (Cesa)

Map 1- Locality of *Smicromyrme atropos* (*Mutillidae*) in western Soutpansberg Mountains, South Africa.

Acknowledgement: We sincerely thank to Prof. Dr. A. S. Lelej (Russia) for his kind collaboration.

Reference:

Bischoff,H., 1920, Monographie der Mutilliden Afrikas. *Archiv. Naturg.* (Ser.A) 68: 1-830, 7 Taf.

Choreutis muhabbet Koçak: Yeni il kaydı ve erken gelişme dönemi (*Lepidoptera, Choreutidae*)[1]

Muhabbet Kemal Kesran Akın[2]

Abstract: *Choreutis muhabbet* Koçak: New provincial record in Turkey and its early stages (*Lepidoptera, Choreutidae*). *Cesa News* 62: 6-12, 12 şekil.
Habitat, food-plant, and early stages of recently described *Choreutis muhabbet* Koçak (*Choreutidae*) were illustrated here for the first time. The species was described from Çatak district in Van Province. Second faunal record belongs to Mutki in the Bitlis Province. The species occurs in East Turkey on stony slopes, where its food-plant dwarf fig bushes grows. The species can only survive, if such habitats with its food-plant are protected.
Key words: *Choreutis muhabbet* , *Choreutidae, Lepidoptera*, Turkey, fauna, ecology, early stages, bionomy, conservation.

Doğu Anadolu'da Van'ın Çatak ilçesinde bulunmasını takiben, 2008 yılında bilim alemi için yeni olarak tanımlanan *Choreutis muhabbet* ile birlikte Türkiye'de bilinen *Choreutidae* familyasına ait tür sayısı 10'a yükselmiştir (Koçak, 2008). İncir ağacı (*Ficus*) üzerinde yaşayan *Choreutis* türlerinin biyolojisi hakkında yapılmış araştırmaların sayısı çok azdır. Birinci yazar tarafından Malatya cıvarında incir ağacının yapraklarında tespit edilen *Choreutis* tırtıllarının gelişimi sonrasında elde edilen pupalardan *Choreutis nemorana* türüne ait erginler elde edilmiştir (Kemal & Koçak,2008). *Choreutis muhabbet* ilk defa Çatak civarında bulunduğunda habitatının 20-30cm yüksekliğinde incir topluluklarının geliştiği kayalık yamaçlar olduğu görülmüştür. 2009 yılında bu alanlarda birinci yazar tarafından yapılan araştırmalarda yerde yayılan incir dallarında gelişmiş yapraklarda *Choreutis* tırtıları bulunmuştur. Elde edilen pupalardan *Choreutis muhabbet* türünün erginleri elde edilmiştir.

2010 yılında ikinci yazarın Bitlis ilinin Mutki ilçesinde yaptığı arazi çalışmalarında, Alatoprak civarında 10 6 2010 tarihinde incir topluluklarında, aynı tip habitatta 9 ergin ve 3 *Choreutis* tırtılı toplanmıştır. Erginler olduğu kadar tırtılların da gelişimlerinin tamamlamasını takiben pupalarından 26 6 2010'da *Choreutis muhabbet* bireyleri elde edilmiştir.

Bu makalede, *Choreutis muhabbet* türünün Doğu Anadolu'daki ikinci kaydının Bitlis ilinin Mutki ilçesi (Alatoprak) olduğu *Ficus carica*'dan toplanan 12 örnekle bir kere daha ortaya konmuştur. Ayrıca, her iki lokalitede habitat görüntüleriyle birlikte, tespit edilen larva, pupa ve ergin bireylerin resimlerine de yer verilmiştir.

Sonuç olarak, Doğu Anadolu Bölgesinde bodur incir topluluklarının bulunabileceği kayalık yerlerde *Choreutis muhabbet* türünün yaşayabileceği beklenebilir. Ancak yerli halkın bu çok az rastlanan incir topluluklarını yakacak olarak ta kullandığı dikkate alınırsa, adı geçen türün varlığının büyük tehdit altında olduğunun vurgulanması gerekir.

Kaynaklar

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Koçak,A.Ö., 2008, Illustration of *Choreutis muhabbet* Koçak,2008 described in Miscellaneous Paper Nr.142 pages 6-7 of the Cesa. *Cesa News* 30: 17, 1 fig.

[1] received on 31 August,2010; accepted 15 September,2010
[2] Bitlis Eren Üniversitesi, Fen Edebiyat Fakültesi, Biyoloji Bölümü, Bitlis/Turkey. e-mail: kesranakin@hotmail.com http://www.bitliseren.edu.tr/BapDetay.aspx?zcms=18&zcmsBap=76

Şekil 1,2. *Choreutis muhabbet*, ergin birey ve habitatı. Van, Çatak 1800m foto M.Kemal (Cesa)

Şekil 3, 4- Bodur *Ficus carica* toplulukları, Van, Çatak 1800m, foto M.Kemal (Cesa)

Şekil 5-6. *Choreutis muhabbet* larvaları tarafından yenmiş yapraklar ve genç larva, Van Çatak 1800m foto M. Kemal (Cesa)

Şekil 7-8. *Choreutis muhabbet* olgun larva dorso-lateral ve dorsal görünüşü, Van Çatak 1800m
foto M. Kemal (Cesa)

Şekil 9. *Choreutis muhabbet* kokon, Van Çatak 1800m foto M. Kemal (Cesa)

Şekil 10. *Choreutis muhabbet*'in besin bitkisi, *Ficus carica*. Bitlis Mutki Alatoprak foto K. Akın

Şekil 11. *Choreutis muhabbet*'in olgun larvası. Bitlis Mutki Alatoprak foto K. Akın

Şekil 12.*Choreutis muhabbet*'in kokonda terkedilen pupasının ön kısmı. Bitlis Mutki Alatoprak foto K. Akın

Keys to Palaearctic subfamilies and genera of the family *Dolichopodidae* (*Diptera*) [3]

Igor Ya. Grichanov [4]
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Abstract: Keys to Palaearctic subfamilies and genera of the family *Dolichopodidae* (*Diptera*). *Cesa News* 62: 13-46, 195 figs.
Revised keys to Palaearctic genera of the family *Dolichopodidae* (*Diptera*) are compiled, including 82 genera of *Dolichopodidae* s.s. and 5 genera of *Microphorinae* and *Parathalassiinae*. Illustration of typical characters of most Palaearctic genera is given.
Key words: *Diptera, Dolichopodidae*, genera, Palaearctic Region, key.

Introduction

The *Dolichopodidae s. str.* fauna of the World is very large, with over 7400 described species belonging to 271 genera, including nearly 100 fossil species and 29 fossil genera (Grichanov 2003–2011). The subfamilies *Microphorinae* and *Parathalassiinae*, which are included in an expanded concept of the *Dolichopodidae* (*i.e. Dolichopodidae s. lat.* or epifamily *Dolichopodoidae*), comprise about 100 species (including 13 fossil species) and 13 genera (*ibid.*). Sixty-six genera of *Dolichopodidae s. str.* were listed in The Catalogue of Palaearctic Diptera (Negrobov 1991), of which many have been placed in synonymy, renamed or restored from synonymy by now. Since the publication of Negrobov's (1991) Catalog, which includes names published up until the end of 1982, a number of new Palaearctic genera of the family have been described. Recently, Grichanov & Negrobov (2011) provided a revised checklist of Palaearctic genera of the family Dolichopodidae, which included 82 genera of *Dolichopodidae* s. str. and 5 genera of *Microphorinae* and *Parathalassiinae*. Grichanov et al. (2011) published a brief synopsis of all Palaearctic genera along with illustration of habitus of some typical and rare species. The latter paper included also references to the most recent keys to species of all dolichopodid genera. Here we give keys to all Palaearctic subfamilies and genera along with illustration of key characters of most genera. A few non-Palaearctic genera (marked with square brackets) from adjacent Regions were also included into the keys. Subfamily keys to genera are arranged alphabetically, but *Microphorinae* and *Parathalassiinae* are given at the end. Line drawings and photos were made by the authors of this paper (except as noted).

Key to Palaearctic subfamilies of the family *Dolichopodidae sensu lato*

1. Discal cell present, emitting 3 veins to wing margin, veins M_1 and M_2 arising independently from discal cell; costa running around the wing; body is black or greyish 2
– Discal cell fused with 2nd basal cell; M_{1+2} usually with a curvation or stub-like M_2 at middle of its distal part (M_{1+2} rarely forking apically into M_1 and true M_2); costa ending at M_1, sometimes at tip of R_{2+3}; body generally metallic or yellow, rarely greyish (*Dolichopodidae sensu stricto*) 3

[3] received on 6th May,2011; accepted on 9th May,2011.

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2. Arista-like stylus bisegmented; male eyes contiguous on frons..... *Microphorinae*
– Arista-like stylus one-segmented; male eyes widely separated on frons..... *Parathalassiinae*
3. Vertex strongly excavated on either side of ocellar tubercle, or if weakly excavated, vein M_{1+2} distinctly branched, with M_2 present at least as a fold on membrane (absent in *Mesorhaga*); scutum usually short, about as wide as long; hypopygium exerted; posterior mesonotum not flattened ..... *Sciapodinae*
– Vertex usually not excavated; vein M_2 absent or present only as short stub-vein; hypopygium various 4
4. Antennal scape with setae on dorsal surface; male hypopygium usually pedunculate and enlarged, and projecting forward under preabdomen; mid- and hind femora with strong anterior preapical bristles; all tibiae with strong setae; posterior mesonotum not flattened ..... *Dolichopodinae*
– Without the above combination of characters (*Anepsiomyia*, *Ceratopos* and some species of *Acymatopus*, *Argyra* and *Syntormon* have setose scape) 5
5. Posterior mesonotum distinctly flattened and slightly depressed, from one-third to one-half of surface between dorsocentral setae, and distinct from curved anterior mesonotum 6
– Posterior mesonotum not flattened, or at most only slightly or apparently flattened immediately anteriad of scutellum.....10
6. Mid- and/or hind femur with distinct anterior or anterodorsal preapical bristle (sympycnine genus *Micropygus* also keys here) ..... *Peloropeodinae*
– Mid- and hind femur bare of major anterior preapical bristle 7
7. Body and legs covered with dense grey tomentum usually obscuring cuticle; mesonotum flattened in posterior quarter only, and flattened area not concave but with weak margin; postpedicel ovate and conical with apical arista-like stylus; palpi often enlarged; found on marine coasts ..... *Hydrophorinae* in part
– Body tomentum usually not dense, and underlying cuticle visible; mesonotum usually strongly flattened or even slightly concave with distinct margin; other features various..... 8
8. Wing vein M_{1+2} distinctly sinuate at middle of distal part, with flexion *(bosse alaire)* in membrane (*Neurigona*); hind basitarsus usually longer than next segment; arista-like stylus usually dorsal; male genitalic capsule usually globular, on peduncle formed by short segment 7, and sometimes enfolded by preceding abdominal segments (*Neurigona*); face with dense tomentosity (*Oncopygius* having wing vein M_{1+2} with indistinct sinuation and male abdominal segment 7 long and setose)..... *Neurigoninae*
– Wing vein M_{1+2} straight or regularly curved, without distinct flexion; hind basitarsus usually much shorter than next segment; arista-like stylus usually apical or rarely subapical; male genitalic capsule ovate to pyriform, on peduncle formed by exserted segment 7, and usually not encapsulated or enfolded by preceding abdominal segments; male abdominal segments 4 and 5 unmodified; face often with metallic cuticle.....9
9. R_{2+3} and M_{1+2} nearly straight and parallel behind *dm-cu*; dorsal postcranium feebly concave; thorax and/or abdomen clear yellow, with or without dark spots dorsally; male segment 7 small ..... *Xanthochlorinae* (*Xanthochlorus* Loew; Figs. 75, 132, 195)
– R_{2+3} and M_{1+2} distinctly curved and convergent behind *dm-cu*; dorsal postcranium distinctly concave; body usually dark coloured, rarely mostly orange or yellow-brown; male segment 7 usually well developed ..... *Medeterinae*
10. Pair of large postvertical setae usually present on dorsal postcranium, out of line with postorbital series; abdomen often dorsoventrally flattened; postorbital setae strong dorsally, but as field of fine, pale hairs across ventral postcranium; crossvein *dm-cu* equal to or longer than distal section of CuA_1; male face usually wide; fronto-clypeal suture distinct, at least laterally; clypeus usually produced anteriorly; palpus usually large in both sexes, and covered with short setae; eye pubescent; hypopygium encapsulated at abdominal apex .... *Hydrophorinae* in part (also see couplet 7)
– Postvertical setae, if present, near vertex; abdomen usually ovate, and rarely dorsoventrally flattened; postorbital setae usually as distinct row of setae on lower postcranium, even if pale coloured; crossvein *dm-cu* usually shorter than distal section of CuA_1; male face often narrow with fronto-clypeal suture obscured; palpus usually small, although sometimes enlarged in males only; other characters various 11
11. Mid and/or hind femora with distinct anterior preapical bristle; antenna usually set high on

head, about one-quarter distance from vertex; head usually ovate in anterior view, higher than wide; anal angle often reduced or lost; male tarsomere 5 rarely with enlarged pulvilli, fore tibia often with anterodorsal row of short setae on distal half; lateral seta of hind coxa usually near middle.....*Sympycninae*

– Mid and hind femora without anterior preapical bristle, or such apparent preapicals indistinct from background setal field; antenna usually near middle of head, two-fifths to one-half distance from vertex; head spherical in anterior view, about as wide as high; anal angle often well developed (both sexes); male tarsomere 5 sometimes with enlarged pulvilli; fore tibia without anterodorsal row of short setae on distal half; lateral seta of hind coxa in basal quarter**... .**.....**.....**12

12. Upper part of proepistemum in front of anterior spiracle with long hairs; postpedicel triangular, and usually much longer than basal width; arista-like stylus strictly apical; male cercus often elongated; veins M_{1+2} and R_{4+5} often slightly bowed with respect to each other ....*Rhaphiinae* (*Rhaphium* Meigen)

– Upper part of proepistemum in front of anterior spiracle with few fine setae or one strong seta or bare; arista-like stylus at most strictly subapical or inserted in apical incision; other features various ..... *Diaphorinae*

Key to Palaearctic genera of *Achalcinae* (Figs. 5–6, 76, 133–134)

1. Six dorsocentrals; fore tibia without basodorsal bristle; hind tibia with only 2 anterodorsal bristles; 6 pubescent abdominal segments; hypopygium with epandrial setae at base of epandrial lobe; dark species with globular thorax and distinctly darkened wings *Achalcus* Loew

– Five dorsocentrals; fore tibia with 1 dorsal bristle at about basal 1/4; hind tibia in most species with 3 anterodorsal bristles; fore femur with erect ventral bristle on basal 1/5-1/3, about as long as femur is deep; 5 pubescent abdominal segments; hypopygium with epandrial setae on shaft of epandrial lobe; yellow or dark brown species..... *Australachalcus* Pollet

Key to Palaearctic genera of *Diaphorinae* (Figs. 7–15, 77–84, 135–141)

1. Costa not extending beyond tip of R_{4+5}; distal vein M_{1+2} gently sinuate or broken or weakened, with distal section often displaced; vein R_{4+5} ending along distal anterior wing margin, well before wing apex; distal parts of R_{4+5} and M_{1+2} strongly diverging 2

– Costa extending beyond tip of R_{4+5}, usually ending at apex of vein M; vein M_{1+2} unbroken, rarely weakened 3

2. Upper part of proepisternum with 2–4 fine setae; acrostichals usually present; male sternite 8 often with strong projecting setae ..... *Asyndetus* Loew

– Upper part of proepisternum usually bare; acrostichals absent or microscopic; male sternite 8 without strong setae ..... *Cryptophleps* Lichtwardt

3. Acrostichal setae absent; female clypeus with four projecting setae; male segment 7 rather long; postgonite prominent, often with a group of pedunculate setae ..... *Acropsilus* Mik

– Acrostichals present, usually biseriate; female clypeus without setae; male segment 7 short; postgonite reduced 4

4. Upper occiput concave; antennal postpedicel usually pressed laterally, bladelike to subtriangular, with distinct apex and dorsal to dorsoapical arista-like stylus 7

– Upper occiput convex or flat; antennal postpedicel usually globular, reniform, conoid or budlike, with indistinct apex, or with slender apical projection, and with subapical or apical, rarely dorsal, arista-like stylus inserted sometimes in apical incision 5

5. Hind coxa with external vertical row of 3-4 setae decreasing in length ventrally; body often with argyraceous tomentosity; scape with dorsal setae (bare in some Holarctic species); antennae positioned at upper quarter of head..... *Argyra* Macquart

– Hind coxa with one external seta at basal quarter; body without argyraceous tomentosity; scape bare; antennae positioned at middle or slightly above middle of head 6

6. Male eyes contiguous below antennae; arista-like stylus preapical (Azores) ..... *Falbouria* Dyte

– Face nearly parallel-sided or slightly narrowing towards clypeus; arista-like stylus dorsal .....

.....*Melanostolus* Kowarz

7. Antennae positioned at middle of head; upper part of proepisternum with 2–4 fine setae; wing usually broadest at basal quarter, with nearly straight R_{4+5} and M_{1+2} veins .... *Diaphorus* Meigen
– Antennae positioned at upper quarter to third of head; upper part of proepisternum usually bare; wing usually broadest at middle, with convex anteriorly R_{4+5} and M_{1+2} veins 8
8. Relatively long, slender species; arista-like stylus dorsal; hypopygial cercus free..... .....*Nematoproctus* Loew
– Short, rather stocky species; arista-like stylus apical or subapical; hypopygial cercus mainly hidden..... 9
9. Face nearly parallel-sided, subequal in width to frons; male postpedicel budlike, with abruptly drawn-out apex; male sternite 8 with strong projecting setae; hypopygial surstylus and epandrial lobe long and thin; male cercus with long distoventral projection *Trigonocera* Becker
– Male eyes convergent or contiguous below antennae; female face distinctly narrowed downwards; male postpedicel globular, reniform or conoid; male sternite 8 with simple hairs, rarely with short thick setae; surstylus and epandrial lobe broad; male cercus without distoventral projection .....*Chrysotus* Meigen

Remarks

1. Bickel (1998) considered *Acropsilus* incertae sedis, rejecting its placement in *Peloropeodinae* and Grichanov (1998) associated the genus with the *Diaphorinae*. Yang et al. (2006) followed Negrobov (1991), placing it in *Peloropeodinae* (see also key to the latter subfamily).

Key to Palaearctic genera of *Dolichopodinae* (Figs. 16–29, 85–93, 142–153)

1. Hind basitarsus with at least 1, usually 2-3 strong setae above 2
– Hind basitarsus without setae above, or if bearing 1-2 feeble dorsal setae on hind basitarsus (a few species of *Poecilobothrus* and *Hercostomus*), then pleura bare in front of posterior spiracle, and M_{1+2} not sigmatoid, weakly curved in distal part) 3
2. Pleura with cluster of fine hairs in front of posterior spiracle; M_{1+2} sigmatoid at middle of distal part, sometimes with a stublike vein; R_{4+5} and M_{1+2} subparallel beyond bend in M; epandrium elongated, at base higher than at apex; arista-like stylus pubescent..... *Dolichopus* Latreille
– Pleura bare in front of posterior spiracle; M_{1+2} strongly curved towards R_{4+5} at basal third of apical part; epandrium subquadrate; arista-like stylus plumose ..... *Pterostylus* Mik
3. Several strong anterodorsal setae in apical half of the hind femur in addition to the true anterior preapical bristle; face narrowed under antennae and somewhat widened towards clypeus; wing vein M_{1+2} usually with gentle curvation before the middle of distal part, then running towards R_{4+5} and reaching costa far before the tip of wing; stylus short and bare; postpedicel usually short and suboval ..... *Tachytrechus* Haliday
– Hind femur usually with one, rarely with 2 true anterior preapical bristles; face regularly narrowed towards clypeus or parallel-sided; wing vein M_{1+2} either with curvation beyond the middle of distal part or M_{1+2} reaching costa near the tip of wing; stylus often pubescent; postpedicel usually subtriangular, asymmetric 4
4. Pleura with cluster of fine hairs in front of posterior spiracle 5
– Pleura bare in front of posterior spiracle 7
5. Clypeus bearing one pair of strong bristles in both sexes; male cercus thick and elongated (nearly as long as epandrium) .....*Setihercostomus* Zhang et Yang
– Clypeus usually bare, sometimes covered with fine hairs; male cercus variable, not as above, much shorter than epandrium 6
6. Fore tibia lacking anterodorsal comb-like row of strong spine-like setae, with 1–3 strong posteroventral setae; male fore tibia with long apicoventral seta; clypeus usually strongly bulging and proboscis greatly enlarged and strongly projecting (especially in females) ....*Ethiromyia* Brooks et Wheeler
– Fore tibia usually with anterodorsal comb-like row of strong spine-like setae, usually lacking strong posteroventral setae; male fore tibia lacking long apicoventral seta; clypeus usually flat

to weakly produced, sometimes strongly produced in female, proboscis not enlarged and strongly projecting ..... *Gymnopternus* Loew

7. Seven dorsocentrals; abdomen dorsoventrally flattened; veins R_{4+5} and M_{1+2} subparallel and sinuous beyond crossvein *dm-cu*; male wing with pronounced convex curve in R_{4+5} and M_{1+2} and darkened apex; surface setae on mid and hind femora well-developed, nearly as strong as preapical bristles; upper and lower propleuron with long dense hairs; prothoracic seta pale or brown; posterodorsal part of postgonite not developed ..... *Muscidideicus* Becker
– Five or six dorsocentrals; abdomen not distinctly dorsoventrally flattened; veins R_{4+5} and M_{1+2} subparallel or convergent beyond crossvein *dm-cu*; M_{1+2} straight or with anterior bend; surface setae on femora usually weak; or if strong, then vein M_{1+2} with strong anterior bend and convergent with R_{4+5}; prothoracic seta usually black; postgonite not as above 8
8. Proboscis and palps greatly elongated and slender, proboscis longer than head is high; vein M_{1+2} beyond crossvein *dm-cu* with weak anterior bend before middle, convergent with R_{4+5} and ending well above wing apex, close to apex of R_{4+5}; basal segment of fore tarsus usually with 3–4 distinct ventral setae ..... *Ortochile* Latreille
– Proboscis thick and short, not exceeding height of head; palps usually short; if long, then relatively broad; M_{1+2} straight or with anterior bend; R_{4+5} and M_{1+2} subparallel or convergent ...9
9. Body non-metallic; head grey, with whitish pollen, wider than high, with frons and face broad in both sexes; frons distinctly wider than high; thorax pale-grey to dark grey or blackish with whitish-grey pollen; antennal stylus dorsal to apical, bare; 6 dorsocentrals, fifth pair usually strongly offset medially; vein M_{1+2} beyond crossvein *dm-cu* usually with strong anterior bend and strongly convergent with R_{4+5}; *dm-cu* located at about half wing length; abdomen yellowish brown; hind basitarsus of male with elongated comma-shaped posterobasal projection; male genitalia with proctiger brushes absent; female oviscapt usually with a pair of rod-like strong ventral lobes, exposed, if projections reduced, then setae of body and legs pale ..... *Argyrochlamys* Lamb
– Body usually metallic, dark; frons distinctly wider than high; 5–6 dorsocentrals, penultimate posterior pair usually in line or weakly offset medially; venation variable, but *dm-cu* located at about half wing length; hind basitarsus of male without comma-shaped posterobasal projection; female oviscapt usually hidden, simple 10
10. Face of male very narrow and strongly converging below; face and clypeus broad in female with sides subparallel or convergent below; antennal stylus dorsal, near base, distal segment strongly pubescent; 5 dorsocentrals; section of M_{1+2} beyond crossvein *dm-cu* with strong, arcuate anterior bend beyond middle, strongly convergent with R_{4+5}; hind femur wide and flat with anterior preapical near apex; hypopygium with elongated anterior apicoventral epandrial seta and distinctive elongated ventral surstylus; apicoventral and basoventral epandrial lobes not developed; proctiger brush sometimes well-developed; male cercus lacking basolateral tail (New World) ..... [*Paraclius arcuatus* lineage]
– Face of male moderately narrow or broad, usually slightly converging at suture; usually 6 dorsocentrals; vein M_{1+2} variously curved in apical part towards anterior wing margin, rarely with strong arcuate anterior bend; hind femur slender with anterior seta positioned at apex, or hind femur widened and flattened with anterior preapical near distal 2/3 to 4/5; epandrium with developed apicoventral epandrial lobe bearing apical setae, rarely reduced to 1-2 setae; proctiger brush reduced; male cercus with more or less distinct basolateral tail 11
11. Hind femur with anterior preapical bristle positioned far from apex, i.e. at 2/3 to 3/5 length from base; hind femur often wide and flat; M_{1+2} often gently curved or sinuate in distal part, usually distinctly convergent with R_{4+5}; antennal pedicel normal; epandrial lobe well developed, often finger-like; hypandrium usually simple, free, basoventral (Afrotropics, possibly the Far East) ..... [*Apelastoneurus* Grichanov]
– Hind femur with anterior seta positioned at apex, usually not or slightly flattened laterally; wing vein M_{1+2} straight, convex anteriorly or weakly sinuate, with flexion at basal third or at middle of distal part and sometimes with subapical flexion; other features various 12
12. Hind femur with 2 or more anterodorsal preapical bristles 13
– Hind femur with 1 anterior or anterodorsal preapical bristle 14
13. Clypeus strongly bulging, subequal in height to face, with lower margin straight, ending well-above lower eye margin; face and clypeus broad in both sexes, weakly converging below; palps

large; proboscis large and thick; mid femur with 2–4 anterior and 2 strong posteroventral preapical bristle in addition to terminal posteroventral preapical bristle that is weakly developed; scutum with violet longitudinal stripe along each row of dorsocentrals ....*Platyopsis* Parent

– Clypeus flat, at most weakly produced in some females, with lower margin rounded or straight; palps and proboscis usually not enlarged, if large, then clypeus extending well beyond lower eye margin; mid femur with 1–5 anterior bristles, occasionally with 1 strong posteroventral preapical bristle (northernmost Oriental China) ..... [*Ahypophyllus* Zhang et Yang]

14. Antennal sockets widely separated and the distance between antennal sockets wider than ocellar tubercle; male face wide and parallel-sided; clypeus long and wide (1/2-1/3 as long as total length of face and clypeus), convex apically and nearly reaching lower margin of eyes; claws elongated, mid and hind pulvilli reduced (northernmost Oriental China) ....[*Aphalacrosoma* Zhang et Yang]

– Distance between antennal sockets shorter than width of ocellar tubercle; male face narrowing downward; clypeus small; claws small; pulvilli developed 15

15. Thorax with distinct dark spot above notopleuron; wing vein M_{1+2} irregularly sinuate, often with subapical flexion; wing distinctly darkened in anterior half along major veins; one strong posterior to posteroventral preapical bristle on mid femur; hypandrium short conical, fused to epandrium laterally; male cercus dark ..... *Poecilobothrus* Mik

– Thorax lacking distinct dark spot above notopleuron; wing vein M_{1+2} regularly sinuate, though sometimes weakly; wing rarely darkened in anterior half; mid femur with 1 strong posterior preapical about even with anterior preapical; hypandrium usually free, basoventral, simple or complex; male cercus light or dark (females are poorly distinguished) 16

16. Body with silvery colour, reduced thoracic setation (e.g., anterior acrostichals absent), broad face and clypeus with the lower margin rounded and extending beyond the lower eye margin; outer margin of antennal sockets distant from inner margin of eyes; fore and/or mid tarsus modified in males; hypopygium small, petiolate..... *Phalacrosoma* Becker

– Not with the above combination of characters 17

17. Wing vein M_{1+2} with flexion at middle of distal part, and sometimes strongly sinuate in males; male antennal pedicel more or less reduced; arista-like stylus often with one or more lamellae; epandrial lobe well developed, sometimes greatly elongated and setose; hypandrium usually free, basoventral, simple or complex .....*Sybistroma* Meigen

– Wing vein M_{1+2} with flexion at basal third or at middle of distal part; antennal pedicel normal; arista-like stylus simple; epandrial lobe either reduced to 1-2 long setae or moderately developed; basiventral epandrial lobes and hypandrium forming a complex of entangled asymmetrical lobes .....*Hercostomus* Loew

Remarks

1. The presence of *Aphalacrosoma* and *Ahypophyllus* in the Palaearctic Region is quite possible.
2. Three Palaearctic *Paraclius* species described from the Far East belong probably to the Afrotropical genus *Apelastoneurus* Grichanov, 2006.
3. Females of *Hercostomus*, *Sybistroma* and *Phalacrosoma* are poorly discernible.

Key to Palaearctic genera of *Hydrophorinae* (Figs. 3–4, 30–47, 94–110, 154–169)

1. Postpedicel usually globular at base, elongated, with drawn-out or conical apex, with apical, rarely subapical arista-like stylus; vertical (fronto-orbital) setae present; posterior mesonotum usually flattened in posterior quarter, but flattened area with weak margin; palpi often enlarged 2
– Postpedicel usually short, not much longer than high, laterally flattened, with rounded apex; arista-like stylus usually dorsal, rarely subapical on short postpedicel; verticals often short or absent; posterior mesonotum usually not flattened; palpi various 12
2. Antennal postpedicel setulose; male fore basitarsus ventrodistally membranous 3
– Postpedicel without setulae; male fore basitarsus rarely membranous ventrodistally 6
3. Secondary setulae on lateral parts of mesonotum and in dorsocentral rows present; no distinct male mesonotal pollinose markings; male fore basitarsus not ventroproximally lobate ..... *Acymatopus* Takagi
– No secondary setulae on lateral parts of mesonotum and in dorsocentral rows; male mesonotal pollinose markings developed to various degree; male fore basitarsus ventroproximally lobate 4
4. Proboscis two thirds as long as eye height; male fore femur with subapical process ventrally; male fore basitarsus with weak ventral tubercle bearing one to two setulae between apical swelling and basal lobe; second tarsomere of same tarsus with one to three long anterodorsal setae ..... *Conchopus* Takagi (*rectus* group)
– Proboscis as long as or longer than eye height; male fore femur lacking subapical process ventrally; male fore basitarsus lacking ventral tubercle between apical swelling and basal lobe; second tarsomere of same tarsus lacking long anterodorsal setae 5
5. Posterior notopleural bristle absent; thoracic pleura with setae in front of posterior spiracle; female postabdomen (sixth and seventh segments) exposed and extensively setose ..... *Thambemyia* Oldroyd
– Posterior notopleural bristle present; thoracic pleura lacking setae in front of posterior spiracle; female postabdomen telescoped, polished, and with pair of posterolateral setae on each tergite and sternite ..... *Conchopus* (exclusive of *rectus* group)
6. Acrostichal setae absent; wing crossvein *dm-cu* located far behind level of R_1 7
– Acrostichal setae present; *dm-cu* located usually right behind level of R_1 10
7. Proboscis with generally protruding hypopharynx; palpus large and triangular; antennal postpedicel bulbous at base and abruptly narrowed distally; arista-like stylus apical ..... *Aphrosylus* Haliday
– Proboscis normal in lateral view, without long protruding hypopharynx; palpus small and ovate; antennal postpedicel ovate-elongated; arista-like stylus subapical 8
8. Proboscis long, about as long as head height (male) or half as long as head height (female); small species, about 2.5 mm long (Alps) ..... *Coracocephalus* Mik in part
– Proboscis usually shorter, than head height; large species, more than 4 mm long 9
9. Scutellum with 3 pairs of strong bristles ..... *Sphyrotarsus* in part (*Takagia* Negrobov)
– Scutellum with at most 2 pairs of strong bristles ..... *Diostracus* Loew in part
10. Antennal postpedicel about as long as high; pedicel with inner projection; R_{4+5} and M_{1+2} nearly straight and parallel; crossvein *dm-cu* longer than distal section of CuA_1 vein (Balkans) ..... *Rhynchoschizus* Dyte
– Antennal postpedicel longer than high; pedicel without inner projection; R_{4+5} and M_{1+2} distinctly convergent; *dm-cu* not longer than distal section of CuA_1 vein 11
11. Antennal postpedicel non-divided, bulbous at base and abruptly narrowed distally, with ventral excavation; male cercus simple ..... *Machaerium* Haliday
– Antennal postpedicel bisegmented and gradually narrowed distally, without ventral excavation; male cercus bilobed ..... *Epithalassius* Mik
12. Face narrow, not wider than ocellar tubercle; acrostichal setae uniseriate at least in anterior part; scutellum with 1 pair of strong bristles; posterior crossvein *dm-cu* shorter than distal part of CuA_1; hypopygium globular, free, with long undivided surstylus ..... *Peodes* Loew
– Face wider than ocellar tubercle; other features various 13
13. Acrostichal setae absent 14
– Acrostichal setae present 21
14. Scutellum with 3 pairs of strong bristles ..... *Sphyrotarsus* Mik (*s.s.*)

– Scutellum with at most 2 pairs of strong bristles 15
15. All tibiae without apical setae; R_{2+3}, R_{4+5}, and M_{1+2} straight and parallel; small species, about 2 mm long (Egypt; Oriental Region) ..... *Paralleloneurum* Becker
– Tibiae usually with strong setae; R_{4+5} and M_{1+2} usually curved 16
16. Antennal scape with dorsal projection; pedicel convex anteriorly; postpedicel elongate-ovate; scutellum with 2 pairs of setae; hind coxa without strong seta; subcosta reduced; male 3rd and 4th abdominal segments with strong black spines; body 5.0-6.5 mm (Caucasus) ..... *Lagodechia* Negrobov et Tsurikov
– Antennal scape without dorsal projection; male 3rd and 4th abdominal segments without strong black spines; other features various 17
17. Proboscis with long protruding hypopharynx; palpus large and triangular; small species, about 2.5 mm long (Canary Islands) ..... *Teneriffa* Becker
– Proboscis normal in lateral view, without protruding hypopharynx; palpus small and ovate 18
18. Proboscis long, about as long as head height (male) or half as long as head height (female); small species, about 2.5 mm long (Alps) ..... *Coracocephalus* Mik in part
– Proboscis shorter, than head height (male) or shorter than half head height (female); usually larger species 19
19. Antennal postpedicel with two long processes (male) or with distinct distal excision (female); small species, about 2.5 mm long (Alps) ..... *Eucoryphus* Mik
– Antennal postpedicel rounded or oval; usually larger species 20
20. Antennal pedicel forming a more or less distinct projection into postpedicel; distal part of CuA_1 longer than *dm-cu* ..... *Thinophilus* Wahlberg
– Antennal pedicel simple, without projection; distal part of CuA_1 shorter than *dm-cu* ..... *Diostracus* Loew in part
21. Fore femora thickened, ventrally with strong bristles and spines 22
– Fore femora not thickened, without strong ventral bristles or spines 23
22. Postpedicel without apicoventral incision; male abdomen behind segment IV with long remarkable appendices ..... *Scellus* Loew
– Postpedicel with apicoventral incision; male abdomen behind segment IV without long remarkable appendices ..... *Hydrophorus* Fallén
23. Mesonotum with small setae; not more than one pair of dorsocentrals; acrostichals in two rows; arista-like stylus subapical (western Mediterranean) ..... *Anahydrophorus* Becker
– Mesonotum with several strong dorsocentrals; acrostichals in one row; arista-like stylus usually dorsal 24
24. Proepimeron rounded at base of fore coxa; scutellum with 2 pairs of strong bristles; hind femur flat; wing veins unmodified except M_{1+2} with two strong bends in males and fair sinuation in females ..... *Orthoceratium* Schrank
– Proepimeron with ventral digitiform projection behind base of fore coxa; scutellum usually with 3 pairs of strong bristles; hind femur cylindric; males and often females with wing veins variously modified, but M_{1+2} without double bend ..... *Liancalus* Loew

Key to Palaearctic genera of *Medeterinae* (Figs. 2, 48–52, 111–114, 170–174)

1. R_{4+5} and M_{1+2} subapically bowed; distal sector of R_{4+5} and M_{1+2} with flexion; posterior pair of acrostichals distinctly larger than preceding pair and offset laterally; usually 6 strong dorsocentrals; antenna sexually dimorphic; male postpedicel elongated; male abdominal segment 7 with tergite and sternite distinct; female tergites 9+10 divided medially into 2 hemitergites, each bearing a row of 4 spines (*Systenini*) ..... *Systenus* Loew, 1857
– R_{4+5} and M_{1+2} subparallel or convergent with M usually arched anteriorly; M_{1+2} without flexion; acrostichals absent or aligned in two rows; usually 5 or fewer dorsocentrals; antenna usually similar in male and female; male postpedicel usually short, rounded or subtriangular; male abdominal segment 7 with tergite and sternite fused or sternite greatly reduced; female hemitergites usually without spines 2
2. R_{4+5} and M_{1+2} behind mid wing parallel to apex; acrostichal setae present; hind coxa with 2 lateral setae; body coloration usually bright metallic green (*Thrypticini*). *Thrypticus* Gerstäcker

– R_{4+5} and M_{1+2} convergent, at most subparallel at apex; if those veins parallel behind mid wing to apex, then acrostichal setae absent or hind coxa with one lateral seta; body coloration usually dark (*Medeterini*) 3
3. Legs entirely devoid of strong setae; hind basitarsus nearly as long as next segment; body size about 1 mm.....*Cyrturella* Collin
– At least mid tibia with some strong setae; rarely only short apicals present; hind basitarsus usually much shorter than next segment; body size usually larger than 1.5 mm.....10
4. Wing with R_1 reaching *dm-cu* level, and M_{1+2} convex behind *dm-cu* towards posterior wing margin, subapically bowed; wing milky-white, brownish along major veins, entirely brownish between R_{4+5} and M_{1+2}; postpedicel short-triangular, with apical stylus; postoculars small, not seriate, arranged in irregular lateral tuft; acrostichals absent; dorsocentrals 3 pairs; scutellum with one pair of setae; fore tibia with one and mid tibia with 3 long apical setae, one of them nearly as long as mid basitarsus (female only).....*Asioligochaetus* Negrobov
– R_{4+5} and M_{1+2} subparallel or convergent, with M usually arched anteriorly and R_1 ending far from *dm-cu* level; postoculars regularly uniseriate; wing hyaline or differently coloured with grey tinge; mid tibia with short apical setae; other features various.....5
5. Fore coxa with long anteroapical spine or hook of cilia, shorter in females; at least fore and hind coxae yellow; male fore tarsomeres 1 and 3 usually modified, with remarkable apical setae or processes, rarely simple, but with slightly thickened tarsomeres 1-4; body usually shining, weakly pollinose; R_{4+5} and M_{1+2} weakly convergent, almost subparallel.....*Dolichophorus* Lichtwardt
– Fore coxa with short anteroapical setae not forming spine or hook; all coxae dark or only fore coxa yellow, rarely fore and hind coxae yellow; male fore tarsus differently modified or simple; body rarely shining .....*Medetera* Fischer von Waldheim

Key to Palaearctic genera of *Neurigoninae* (Figs. 53–54, 115–116, 175–176)

1. Acrostichal setae more or less distinctly uniseriate; wing vein M_{1+2} with indistinct sinuation; male abdominal segment 7 long and setose; hypopygium with narrow surstyli and long and narrow cercus.....*Oncopygius* Mik
– Acrostichals distinctly biseriate, even though sometimes small; wing vein M_{1+2} with usually distinct sinuation; male abdominal segment 7 reduced; hypopygium with broad surstyli and short cercus .....*Neurigona* Rondani

Key to Palaearctic genera of *Peloropeodinae* (Figs. 55–62, 117–121, 177–185)

1. Body almost entirely yellow; arista-like stylus dorsoapical; male hind basitarsus with several short ventral bristles at base; hypopygium partly concealed; dorsal and ventral lobes of surstylus fused almost to apex .....*Pseudoxanthochlorus* Negrobov
– Body light metallic green, shining or dark-green, brown or black, sometimes light-brown in places; sometimes female abdomen mostly or entirely yellow; other features various..... 2
2. Head and thorax with yellow bristles; body mostly light green, metallic shining; female sometimes having some yellow abdominal tergites 3
– Head and thorax with dark bristles; mesonotum and abdomen dark-green, brown or black..... 4
3. Acrostichal setae biseriate; hypopygium large and free, green; female abdomen entirely green ... .*Guzeriplia* Negrobov
– Acrostichal setae absent; hypopygium large and free, entirely yellow; female abdomen entirely green..... *Fedtshenkomyia* Stackelberg
– Acrostichal setae absent or uniseriate; hypopygium small, partly enclosed into abdomen; female usually having some yellow abdominal tergites ..... *Chrysotimus* Loew
4. Acrostichal setae absent 5
– Acrostichals distinct, even though sometimes small 6
5. Arista-like stylus dorsal; wing hyaline; scutellum with only one pair of setae; hind femur with preapical bristle; male hypopygium sessile ..... *Micromorphus* Mik
– Arista-like stylus apical or subapical, inserted in notch of postpedicel; wing hyaline; scutellum with additional pair of hair-like setae; hind femur without preapical bristle; male hypopygium pedunculate.....*Acropsilus* Mik

– Arista-like stylus dorsal; wing fumose with whitish spot at *dm-cu*; hind femur with preapical bristle; male hypopygium sessile ..... *Micropygus* Bickel et Dyte
6. Wing vein *dm-cu* close to wing base, much shorter than distal section of CuA_1; postpedicel large, with short subapical arista-like stylus; antennal pedicel, seen on inside face, with large projection; male abdominal segment 7 about as large as segment 6..... *Vetimicrotes* Dyte
– Wing vein *dm-cu* close to middle of wing, not much shorter than distal section of CuA_1; antennal pedicel without inner projection; male abdominal segment 7 reduced 7
7. Arista-like stylus dorsal; male with asymmetrical claws on fore tarsus; male mid coxa usually with apical spine of glued cilia ..... *Peloropeodes* Wheeler
– Arista-like stylus apical or subapical, inserted in notch of postpedicel; male with symmetrical claws on fore tarsus; male mid coxa without apical spine of glued cilia ..... *Nepalomyia* Hollis

Key to Palaearctic genera of *Sciapodinae* (Figs. 64–66, 123–124, 187–189)

1. Mid and/or hind femora with distinct anterior preapical bristles (absent in some species)..... ..... *Sciapus* Zeller in part
– Femora without strong anterior preapical bristles..... 2
2. Vein M_2 absent, without fold or indication on membrane; dorsocentral bristles strong in both sexes; arista-like stylus usually dorsal; strong vertical seta present in both sexes; clypeus adjacent to margin of eyes ..... *Mesorhaga* Schiner
– Vein M_2 present, even if as fold or indication on membrane; other features various 3
3. Both pairs of scutellar setae long; wing often with dark brown band; arista-like stylus dorsal or dorsoapical; pedicel usually with long dorsal and ventral setae..... *Condylostylus* Bigot
– Scutellum usually with one pair of strong setae, lateral setae short, hairlike or absent; other features various 4
4. Arista-like stylus usually distinctly dorsal on subrectangular postpedicel and rarely longer than head width, or if apical or dorsoapical, then always with following characters: male arista-like stylus rarely with apical flag, tibial chaetotaxy often weak, especially on males; *dm-cu* usually straight 5
– Arista-like stylus usually apical on triangular postpedicel; *dm-cu* often sinuous; arista-like stylus usually long, and more than half body length in females; male arista-like stylus sometimes with apical flag; fore tibia often with long setae 6
5. Six pairs of strong dorsocentrals; phallus simple..... *Sciapus* Zeller in part
– 4-5 pairs of dorsocentrals with anterior ones often reduced; phallus with dorsal angle..... ..... *Amblypsilopus* Bigot in part
6. Crossvein *dm-cu* usually straight, 2 or 3 long acrostichal setae present, legs elongated, with a few major setae, male fore tibia sometimes with strong curved posterior subapical seta; cercus usually simple ..... *Amblypsilopus* Bigot in part
– Crossvein *dm-cu* usually sinuous; tibiae often with major setae; cercus usually deeply forked .... *Chrysosoma* Guérin-Méneville

Key to Palaearctic genera of *Sympycninae* (Figs. 1, 67–74, 125–131, 190–194)

1. Antennal pedicel, seen on inside face, forming a more or less long thumb-like projection into postpedicel; scape with hairs above; arista-like stylus apical or subapical; female face bulging, in lateral view projecting beyond curvature of eye 2
– Antennal pedicel simple, vase-like or globular, without thumb-like projection; arista-like stylus often distinctly dorsal; female face usually not bulging, conforming with curvature of eyes.....3
2. Crossvein *dm-cu* straight, forming nearly right angle with longitudinal wing axis; male arista-like stylus simple; male eyes not contiguous ..... *Syntormon* Loew
– Crossvein *dm-cu* sinuate and unusually angled in both sexes; arista-like stylus bearing apical flag in male; male eyes joined across the face ..... *Ceratopos* Vaillant
3. Mesonotum with flat mid-posterior slope 4
– Mesonotum not flattened, or at most only slightly flattened immediately anteriad of scutellum 5
4. Wing fumose with whitish spot at *dm-cu*; acrostichals absent (British Isles and New Zealand).... ..... *Micropygus* Bickel et Dyte
– Wing hyaline; acrostichals uniseriate (Russian Far East)..... *Suschania* Negrobov

5. Scape with hairs above; postpedicel more than twice as long as high, with almost basal arista-like stylus; fore femur and tibia finely spinose beneath ..... *Anepsiomyia* Bezzi
– Scape bare above; postpedicel usually shorter, with dorsal arista-like stylus; fore femur and tibia rarely spinose beneath 5
6. Abdomen broad, dorsoventrally flattened, and often short; face of both sexes narrowest near middle, extending downward; metepimeron, in front of posterior spiracle, with fine hairs; fore tibia without anterodorsal row of short setae on distal half; male fore and/or mid leg often strongly modified ..... *Campsicnemus* Haliday
– Abdomen usually cylindrical; face of both sexes parallel or gradually narrowed ventrally; metepimeron bare; other features various 6
7. Acrostichal setae absent; mesonotum often with two large black or brown lateral spot; last fore segments of all tarsi regularly decreasing in length; male tarsi practically unmodified (Afrotropics) ..... [*Sympycnus* Loew (Group I)]
– Acrostichals distinct, even though sometimes small; mesonotum either without black or brown lateral spots or with two large velvety black lateral spots; male tarsi often ornamented 7
8. Mesonotum with two large velvety black lateral spots; four pairs of dorsocentral bristles; acrostichal setae in two regular rows; male tarsi practically unmodified .... *Lamprochromus* Mik
– Mesonotum without large velvety black lateral spots; male tarsi often ornamented; other features various 8
9. Three or 4 pairs of strong dorsocentrals; male anterior tarsomeres rarely simple, usually shortened, some of them often flattened or ornamented with processes, spines or remarkable hairs; last four hind tarsomeres regularly decreasing in length; male hind basitarsus often ornamented with remarkable setae or hairs; female clypeus strongly bulging 9
– At least 5 pairs of strong dorsocentrals; fore tarsomeres usually simple or shortened, rarely ornamented with remarkable hairs; last four hind tarsomeres of male usually irregularly decreasing in length; male hind basitarsus rarely ornamented with remarkable setae or hairs; female clypeus flat 10
10. Male hind basitarsus often ornamented with remarkable setae or hairs; antennal arista-like stylus simple (Afrotropics) ..... [*Sympycnus* Loew (Group III)]
– Male hind basitarsus simple; arista-like stylus lanceolate at apex in male, long pubescent in female ..... *Telmaturgus* Mik
11. Wing veins R_{4+5} and M_{1+2} slightly diverging behind crossvein *dm–cu* rather than parallel; male wing costa usually with long and thick stigma beyond R_1; male mid and hind tibiae usually ornamented with remarkable bristles or processes ..... *Teuchophorus* Loew
– Wing veins R_{4+5} and M_{1+2} parallel; male wing costa simple; mid and hind tibiae usually without remarkable bristles or processes 12
12. Five pairs of strong dorsocentrals; two basal hind tarsomeres shortened; male hind tarsomere 2 with apicoventral worm-like process; tarsomere 3 longer than 2; tarsomere 4 shorter than 3 .... *Chaetogonopteron* De Meijere
– Usually 6, rarely 5 pairs of strong dorsocentrals; two basal hind tarsomeres not shortened in male; male hind tarsomere 2 never having worm-like process; male hind tarsomere 3 shorter than 2, often bearing one or more modified setae; tarsomere 4 usually longer and thinner than 3, often polished ..... *Sympycnus* Loew (Group II)

Remarks

1. Species groups in the genus *Sympycnus* are defined after Grichanov (2008).
2. Sympycnine genus *Micropygus* keys also to Peloropeodinae (see key to the latter subfamily).

Key to Palaearctic genera of *Microphorinae*

1. Face flat, somewhat concave; 3 or 4 pairs of scutellar bristles ..... *Microphor* Macquart
– Face with deep emargination below; 1 or 2 pairs of scutellar bristles ..... *Schistostoma* Becker

Key to Palaearctic genera of *Parathalassiinae*

1. Cubital cell rounded distally; 4 or 6 pairs of scutellar bristles..... *Parathalassius* Mik
– Cubital cell rectangular distally; 2 pairs of scutellar bristles 2
2. Cheeks narrow; costal vein with 1 bristle at wing base..... *Microphorella* Becker
– Cheeks wide; costal vein with 3-4 spiniform bristles at wing base (Japan) .....
..... *Thalassophorus* Saigusa

Acknowledgments

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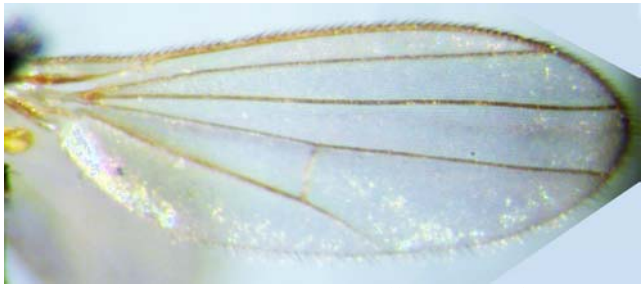
1. *Campsicnemus scambus* (Fallen, 1823)
Photo by Dr. Nikita Vikhrev (Moscow, Russia) with kind permission.

2. *Medetera flavipes* Meigen, 1824
Photo by Dr. Nikita Vikhrev (Moscow, Russia) with kind permission.

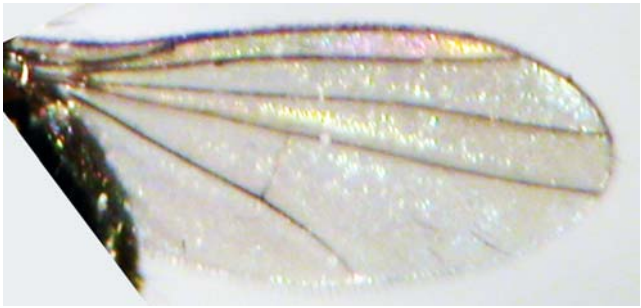
3. *Acymatopus minor* Takagi, 1965

4. *Conchopus borealis* Takagi, 1965

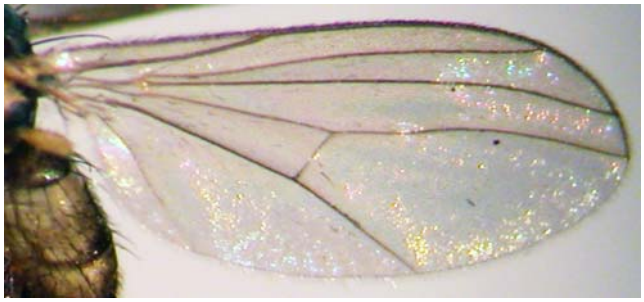
Figs. 1–4 – Habitus of some species of *Sympycninae* (1), *Medeterinae* (2) and *Hydrophorinae* (3–4).



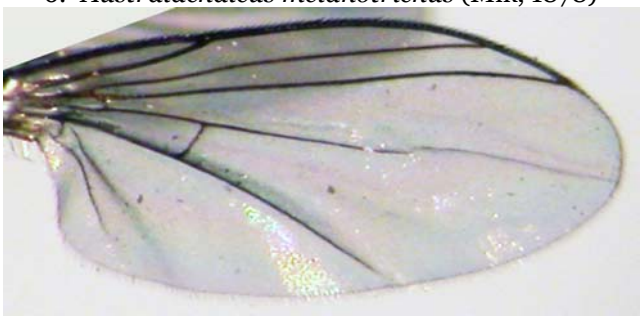
5. *Achalcus nigropunctatus* Pollet et Brunhes, 1996



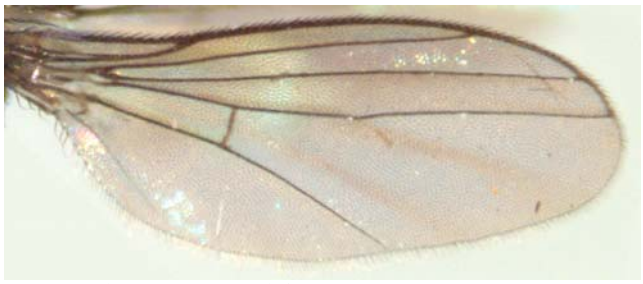
6. *Australachalcus melanotrichus* (Mik, 1878)



7. *Argyra grata* Loew, 1857

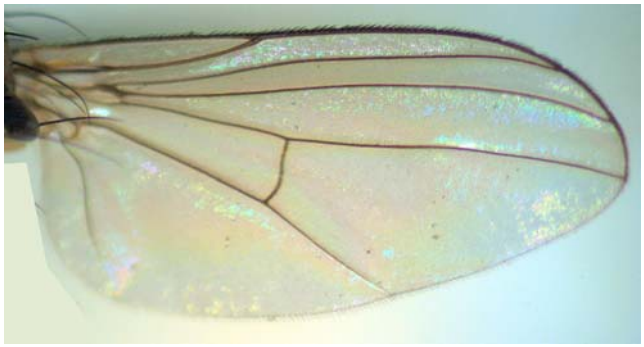


8. *Asyndetus latifrons* (Loew, 1857)



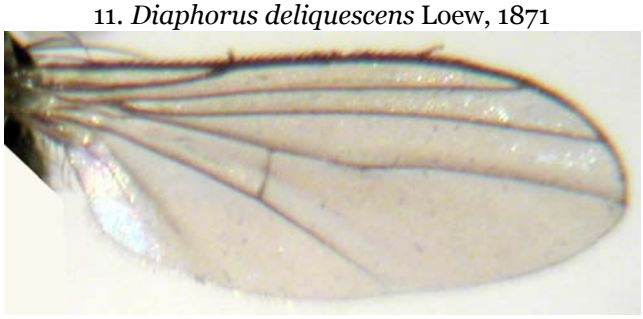
9. *Chrysotus viridifemoratus* von Roser, 1840

10. *Cryptophleps kerteszi* Lichtwardt, 1898



11. *Diaphorus deliquescens* Loew, 1871

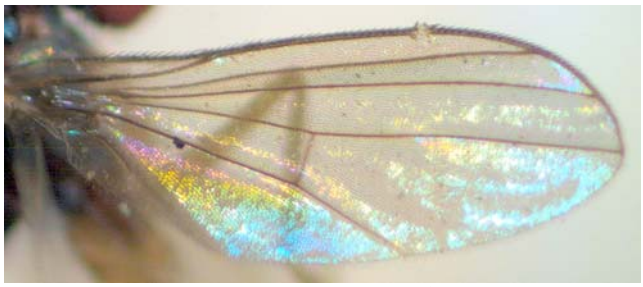
12. *Falbouria acorensis* (Parent, 1933)



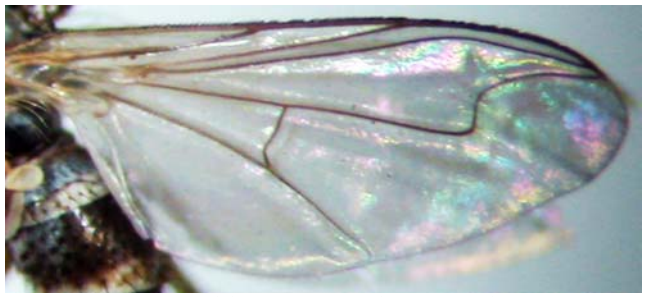
13. *Melanostolus melancholicus* (Loew, 1869)

14. *Nematoproctus praesectus* Loew, 1869

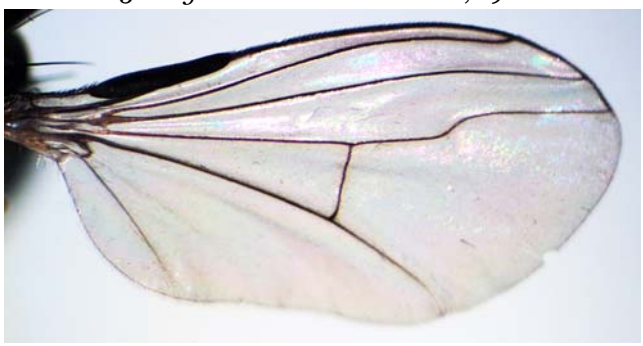
Figs. 5–14 – Wings of some species of *Achalcinae* (5–6) and *Diaphorinae* (7–14).



15. *Trigonocera rivosa* Becker, 1902



16. *Argyrochlamys impudicus* Lamb, 1922



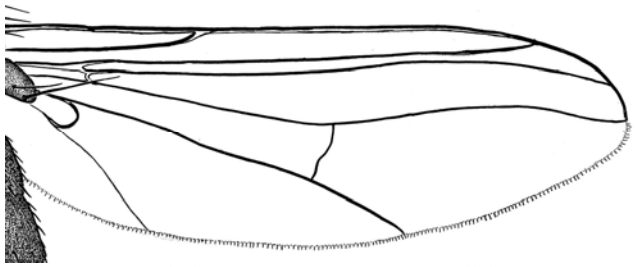
17. *Dolichopus tumicosta* Negrobov, Grichanov et Barkalov, 2009

18. *Dolichopus medvedevi* Grichanov, 2009

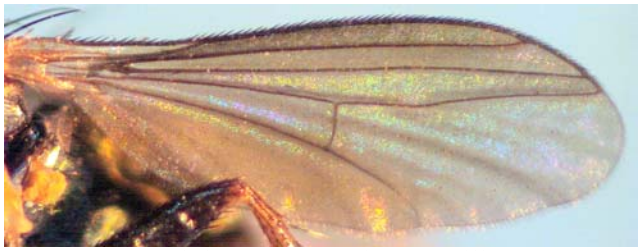
19. *Ethiromyia chalybea* (Wiedemann, 1817)

20. *Gymnopternus brevicornis* (Staeger, 1842)

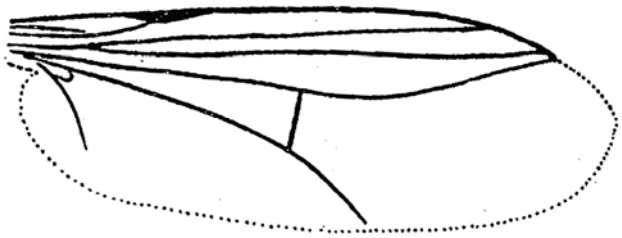
21. *Hercostomus phoebus* Parent, 1927



22. *Muscidideicus praetextatus* (Haliday, 1855)

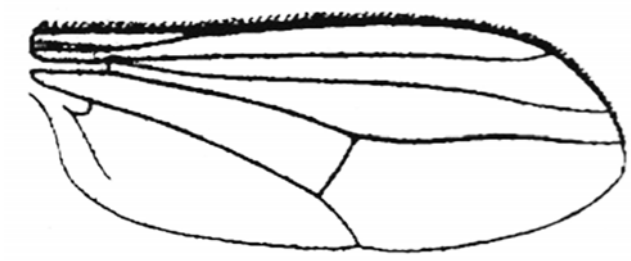


23. *Ortochile nigrocoerulea* Latreille, 1809



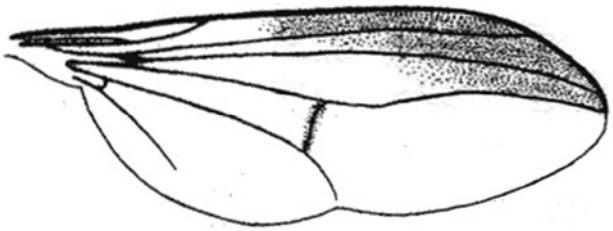
24. *Paraclius septentrionalis* Negrobov, 1980

Figs. 15–24 – Wings of some species of *Diaphorinae* (15) and *Dolichopodinae* (16–24).

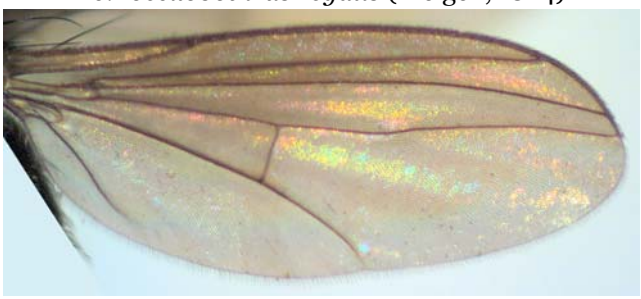


25.*Platyopsis maroccanus* (Parent, 1929)

26.*Poecilobothrus regalis* (Meigen, 1824)

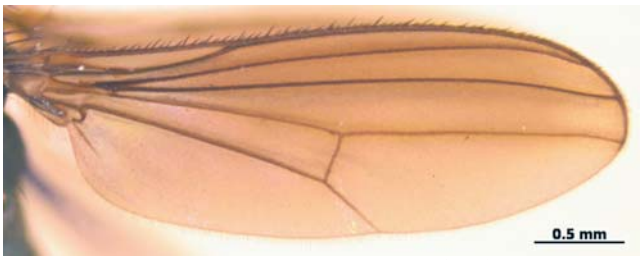


27.*Pterostylus aberrans* (Loew, 1871)

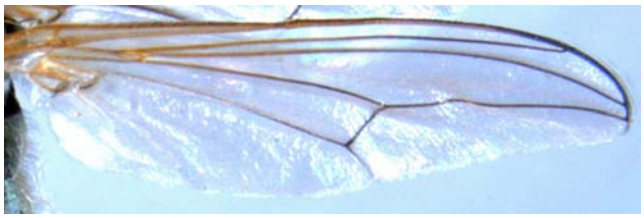


28. *Sybistroma transcaucasica* (Stackelberg, 1941)

29.*Tachytrechus beckeri* Lichtwardt, 1917



30. *Acymatopus minor* Takagi, 1965

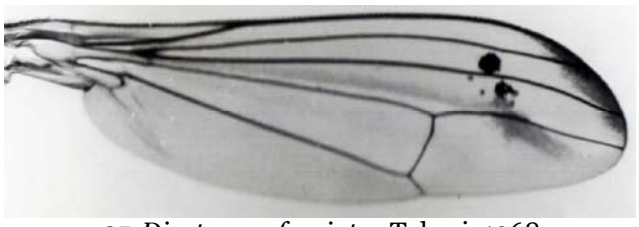


31.*Anahydrophorus cinereus* (Fabricius, 1805)

32.*Aphrosylus parcearmatus* Parent, 1925

33.*Conchopus borealis* Takagi, 1965

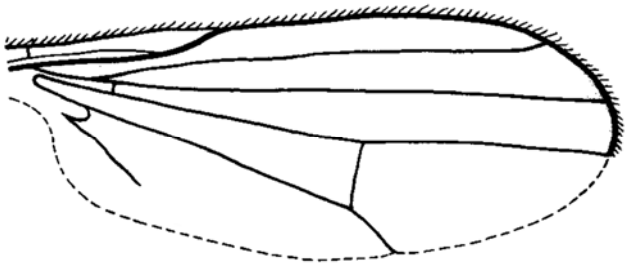
34.*Coracocephalus strobli* Mik, 1892



35.*Diostracus fasciatus* Takagi, 1968

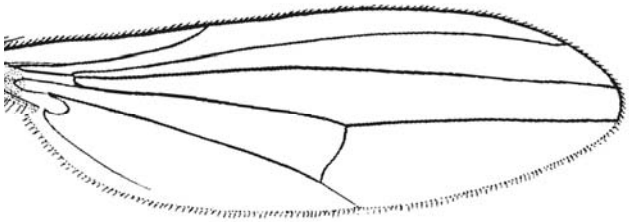
36.*Epithalassius susmani* Grichanov, 2008

Figs. 25–36 – Wings of some species of *Dolichopodinae* (25–29) and *Hydrophorinae* (30–36).



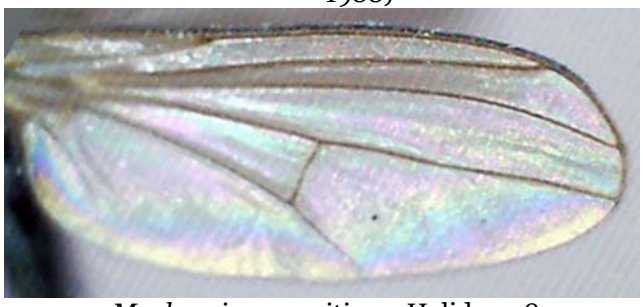
37.*Eucoryphus brunneri* Mik, 1869

38.*Hydrophorus bipunctatus* (Lehmann, 1822)

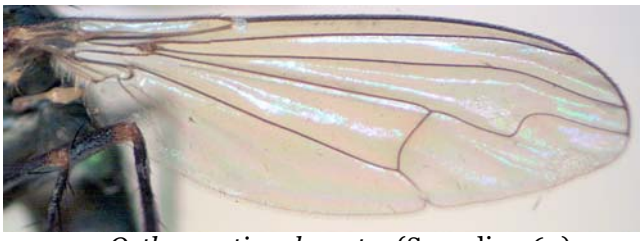


39.*Lagodechia spinulifera* (Negrobov et Tsurikov, 1988)

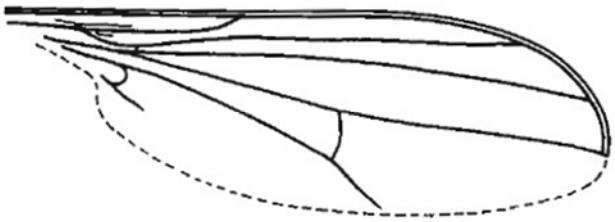
40. *Liancalus virens* (Scopoli,1763)



41. *Machaerium maritimae* Haliday, 1832

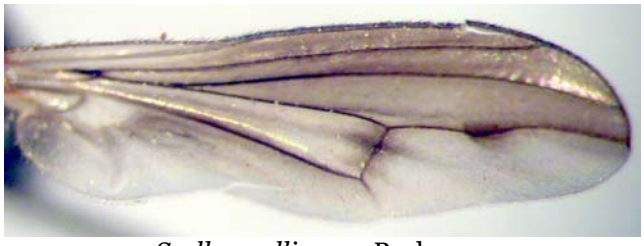


42.*Orthoceratium lacustre* (Scopoli, 1763)



43.*Paralleloneurum cilifemoratum* Becker, 1902

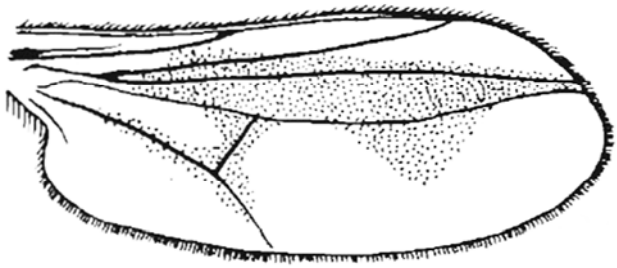
44.*Peodes forcipatus* Loew, 1857



45.*Scellus gallicanus* Becker, 1909

46.*Sphyrotarsus caucasicus* Negrobov, 1965

47.*Thinophilus ruficornis* (Haliday, 1838)

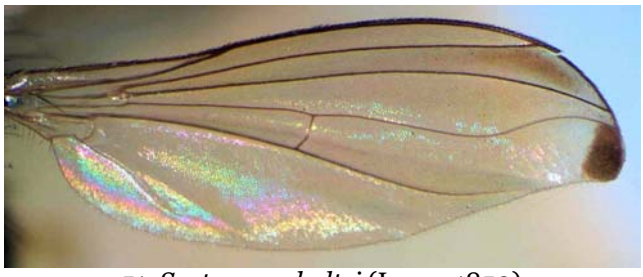


48. *Asioligochaetus vlasovi* (Stackelberg, 1937)

Figs. 37–48 – Wings of some species of *Hydrophorinae* (37–47) and *Medeterinae* (48).

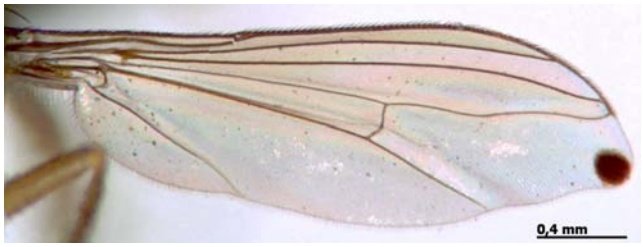
49.*Dolichophorus kerteszi* Lichtwardt, 1902

50.*Medetera sfax* Grichanov, 2010

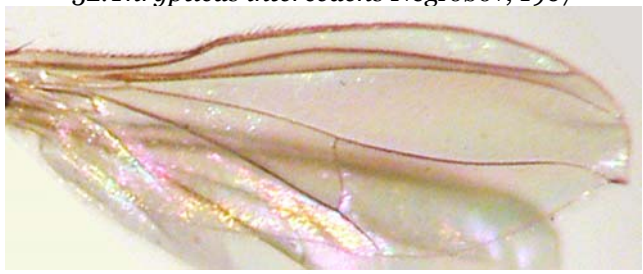


51. *Systenus scholtzi* (Loew, 1850)

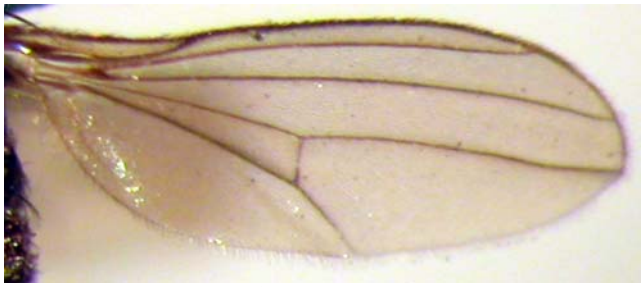
52.*Thrypticus intercedens* Negrobov, 1967



53.*Neurigona solodovnikovi* Grichanov, 2010

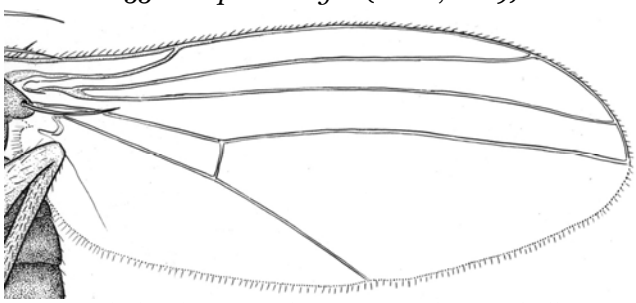


54.*Oncopygius distans* (Loew, 1857)



55.*Acropsilus niger* (Loew, 1869)

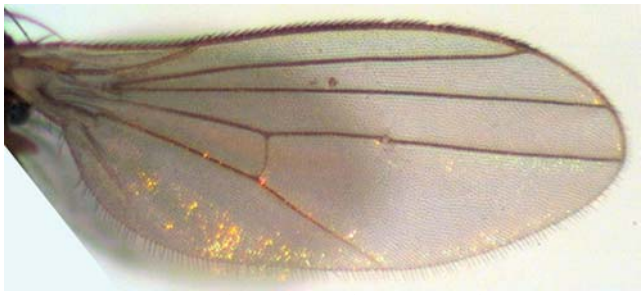
56.*Chrysotimus molliculus* (Fallen, 1823)



57.*Fedtshenkomyia chrysotymoides* Stackelberg, 1927

58.*Guzeriplia chlorina* Negrobov, 1968

Figs. 49–58 – Wings of some species of *Medeterinae* (49–52), *Neurigoninae* (53–54) and *Peloropeodinae* (55–58).

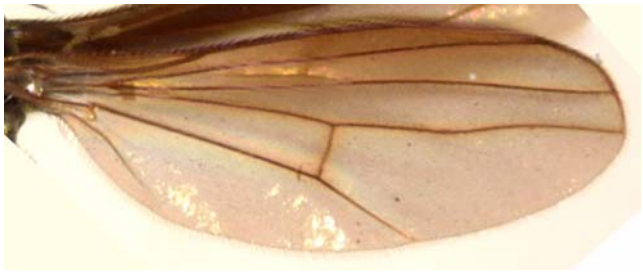


59. *Micromorphus shamshevi* Negrobov, 2000

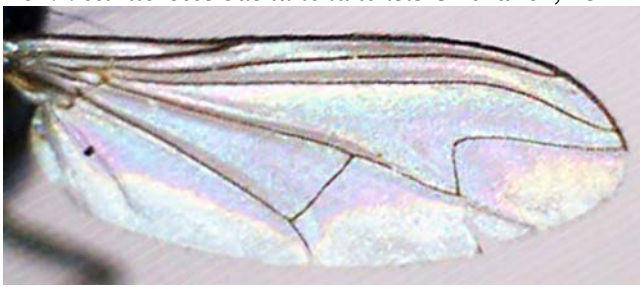
60. *Peloropeodes acuticornis* (Oldenberg, 1916)

61. *Pseudoxanthochlorus micropygus* Negrobov, 1977

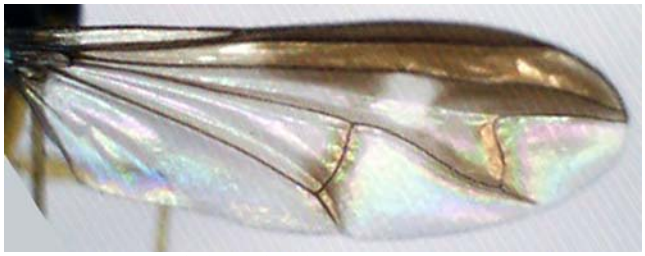
62. *Vetimicrotes baskunchakensis* Grichanov, 2011



63. *Rhaphium umbripenne* (Frey, 1915)



64. *Amblypsilopus pilosus* (Negrobov, 1979) [*Mesorhaga*], **comb.nov.**



65. *Condylostylus luteicoxa* Parent, 1929

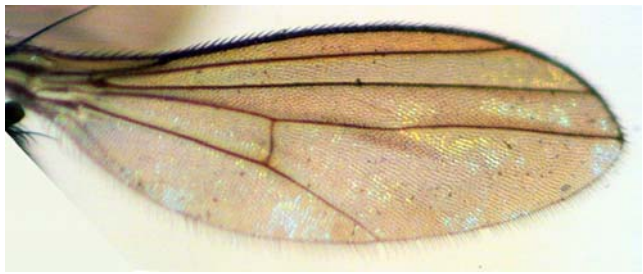
66. *Sciapus polozhentsevi* Negrobov, 1977

67. *Anepsiomyia flaviventris* (Meigen, 1824)

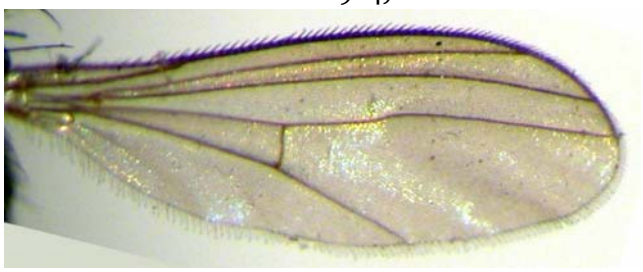
68. *Campsicnemus konstantini* Grichanov, 2011

Figs. 59–68 – Wings of some species of *Peloropeodinae* (59–62), *Rhaphiinae* (63), *Sciapodinae* (64–66) and *Sympycninae* (67–68).

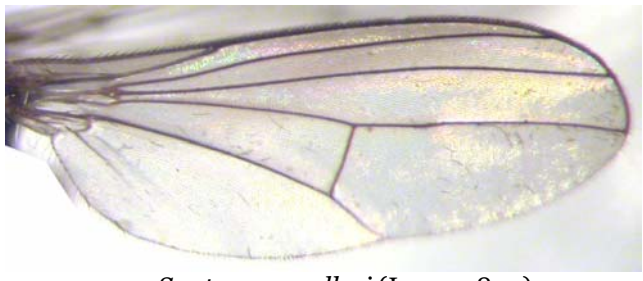
69.*Chaetogonopteron nectarophagum* (Curran, 1924)



70. *Lamprochromus bifasciatus* (Macquart, 1827)

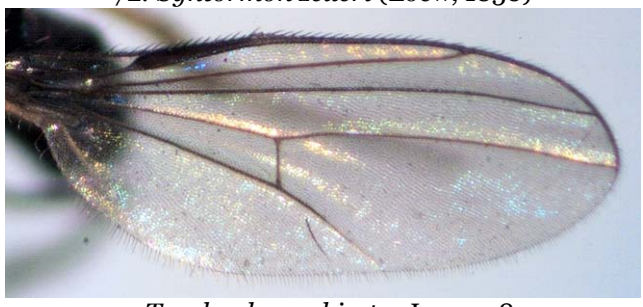


71. *Sympycnus aeneicoxa* (Meigen, 1824)



72. *Syntormon zelleri* (Loew, 1850)

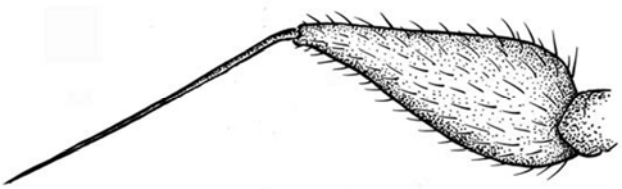
73. *Telmaturgus tumidulus* (Raddatz, 1873)



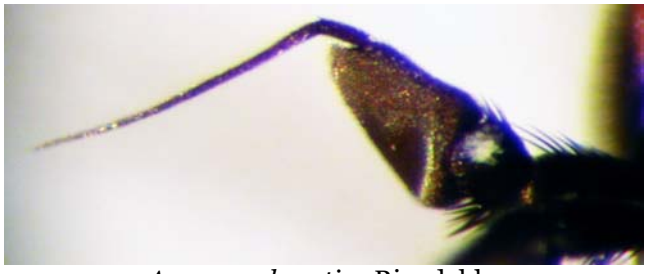
74. *Teuchophorus bisetus* Loew, 1871

75. *Xanthochlorus tenellus* (Wiedemann, 1817)

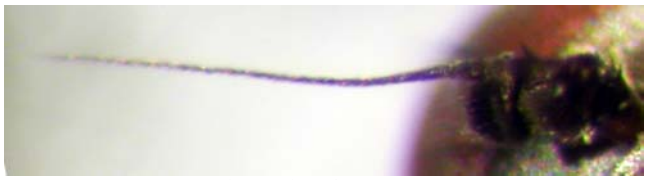
Figs. 69–75 – Wings of some species of *Sympycninae* (69–74) and *Xanthochlorinae* (75).



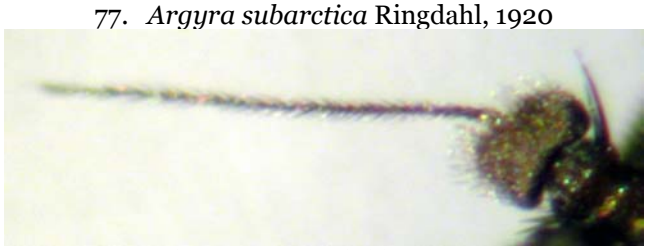
76. *Achalcus polleti* Negrobov et Selivanova, 2010



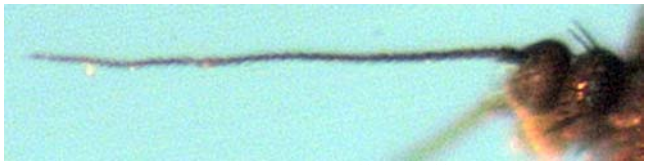
77. *Argyra subarctica* Ringdahl, 1920



78. *Asyndetus latifrons* (Loew, 1857)



79. *Chrysotus ringdahli* Parent, 1929



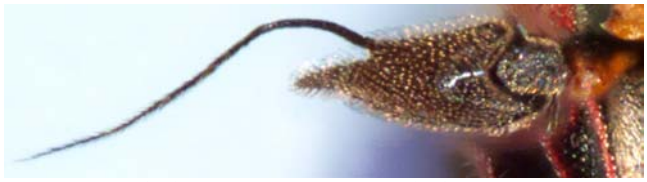
80. *Diaphorus gredleri* Mik, 1880

81. *Falbouria acorensis* (Parent, 1933)

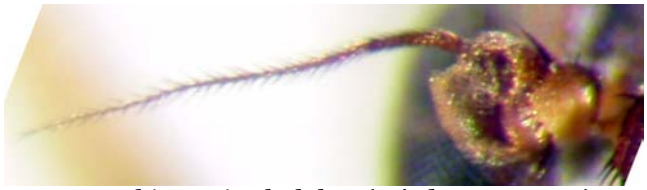
82. *Melanostolus tatianae* Negrobov, 1965

83. *Nematoproctus praesectus* Loew, 1869

84. *Trigonocera rivosa* Becker, 1902



85. *Dolichopus acuticornis* Wiedemann, 1817



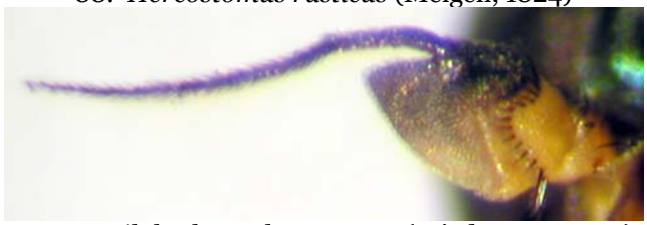
86. *Ethiromyia chalybea* (Wiedemann, 1817)

87. *Gymnopternus cupreus* (Fallen, 1823)

Figs. 76–87 – Antennae of some species of *Achalcinae* (76), *Diaphorinae* (77–84) and *Dolichopodinae* (85–87).

88. *Hercostomus rusticus* (Meigen, 1824)

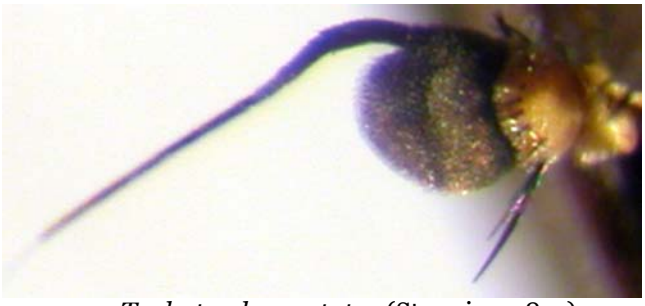
89. *Ortochile nigrocoerulea* Latreille, 1809



90. *Poecilobothrus chrysozygos* (Wiedemann, 1817)

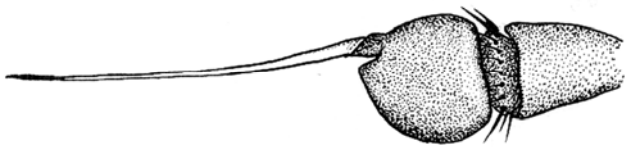
91. *Setihercostomus setifacies* (Stackelberg, 1933)

92. *Sybistroma impar* (Rondani, 1843)



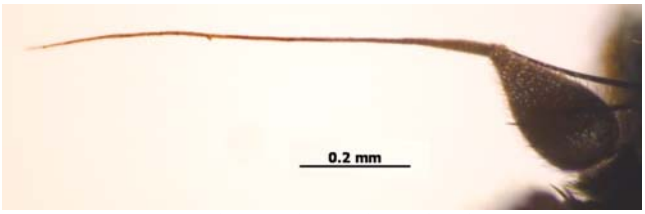
93. *Tachytrechus notatus* (Stannius, 1831)

94. *Acymatopus minor* Takagi, 1965

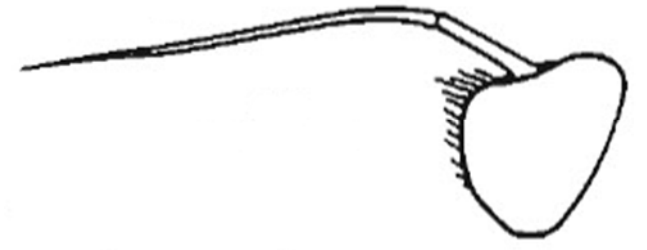


95. *Anahydrophorus cinereus* (Fabricius, 1805)

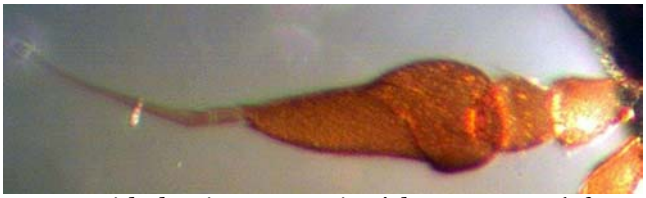
96. *Aphrosylus fuscipennis* Strobl, 1909



97. *Conchopus borealis* Takagi, 1965

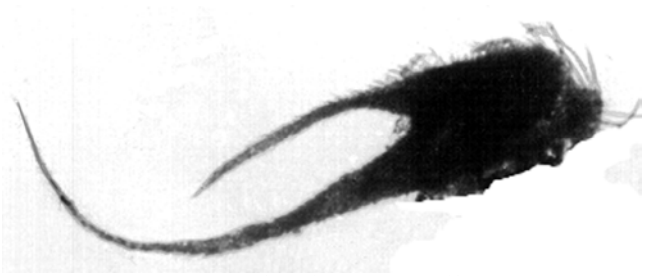


98. *Coracocephalus strobli* Mik, 1892

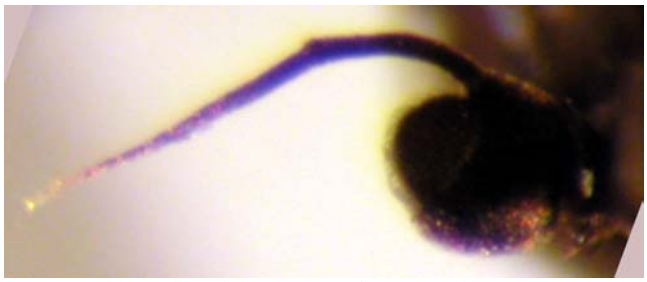


99. *Epithalassius susmani* Grichanov, 2008 (after maceration)

Figs. 88–99 – Antennae of some species of *Dolichopodinae* (88–93) and *Hydrophorinae* (94–99).

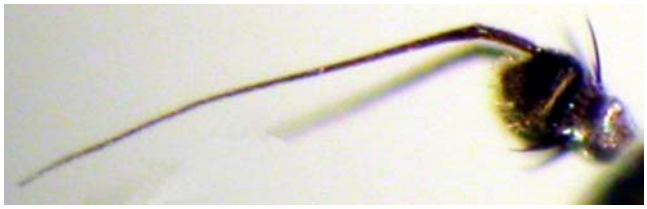


100. *Eucoryphus brunneri* Mik, 1869

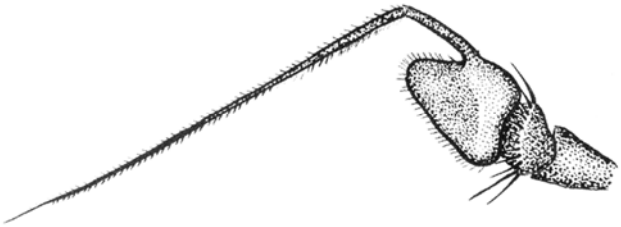


101. *Hydrophorus signifer* Coquillett, 1899

102. *Lagodechia spinulifera* (Negrobov et Tsurikov, 1988)



103. *Liancalus virens* (Scopoli,1763)



104. *Orthoceratium lacustre* (Scopoli, 1763)

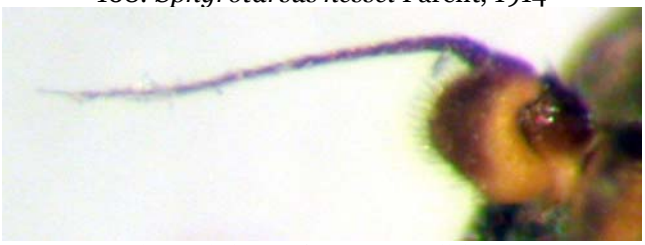
105. *Paralleloneurum cilifemoratum* Becker, 1902

106. *Peodes forcipatus* Loew, 1857

107. *Scellus dolichocerus* Gerstäcker, 1864

108. *Sphyrotarsus hessei* Parent, 1914

109. *Teneriffa spicata* Becker, 1908



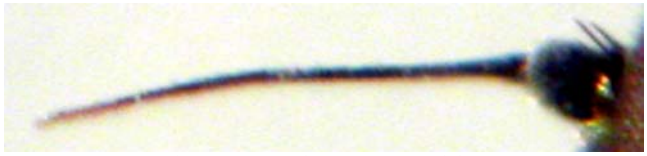
110. *Thinophilus ruficornis* (Haliday, 1838)

111. *Dolichophorus kerteszi* Lichtwardt, 1902

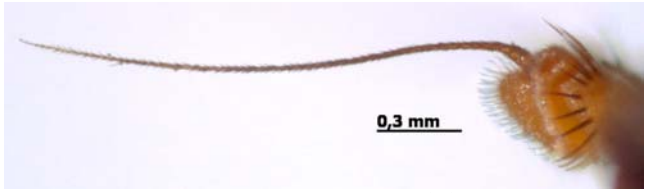
112. *Medetera sfax* Grichanov, 2010

113. *Systenus scholtzi* (Loew, 1850)

Figs. 100–113 – Antennae of some species of *Hydrophorinae* (100–110) and *Medeterinae* (111–113).

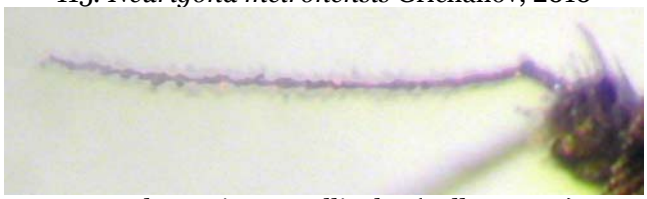


114. *Thrypticus divisus* (Strobl, 1880)



115. *Neurigona meironensis* Grichanov, 2010

116. *Oncopygius magnificus* Loew, 1873

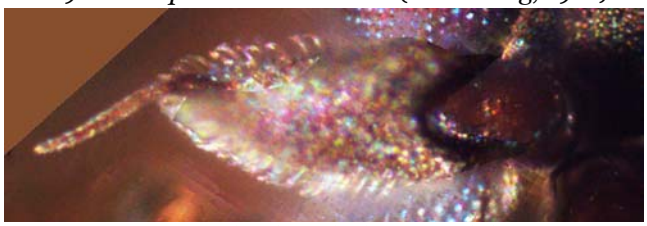


117. *Chrysotimus molliculus* (Fallen, 1823)

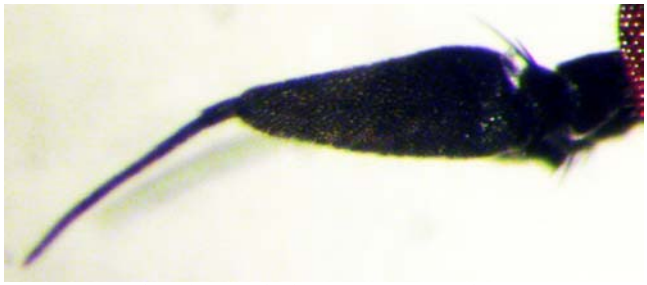
118. *Fedtshenkomyia chrysotymoides* Stackelberg, 1927

119. *Peloropeodes acuticornis* (Oldenberg, 1916)

120. *Pseudoxanthochlorus micropygus* Negrobov, 1977



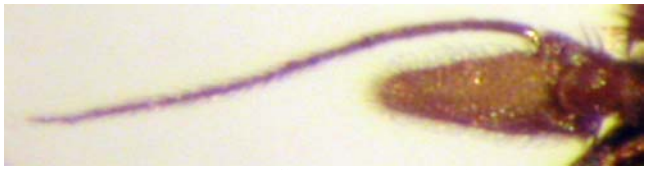
121. *Vetimicrotes baskunchakensis* Grichanov, 2011



122. *Rhaphium dichromum* Negrobov, 1976

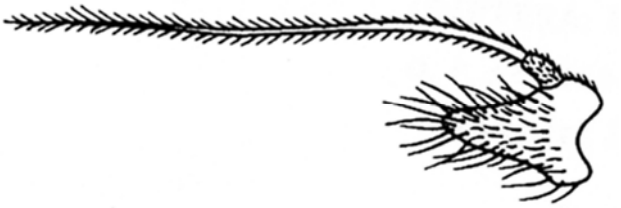
123. *Condylostylus luteicoxa* Parent, 1929

124. *Sciapus richterae* Negrobov et Grichanov, 2010



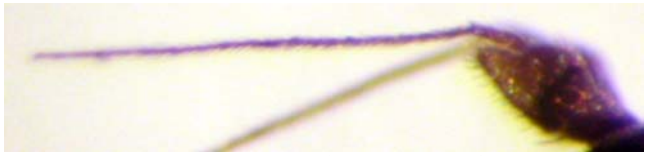
125. *Anepsiomyia flaviventris* (Meigen, 1824)

126. *Campsicnemus tomkovichi* Grichanov, 2009



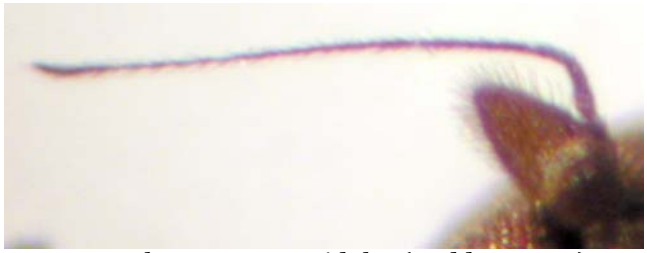
127. *Lamprochromus bifasciatus* (Macquart, 1827)

Figs. 114–127 – Antennae of some species of *Medeterinae* (114), *Neurigoninae* (115–116), *Peloropeodinae* (117–121), *Rhaphiinae* (122), *Sciapodinae* (123–124) and *Sympycninae* (125–127).



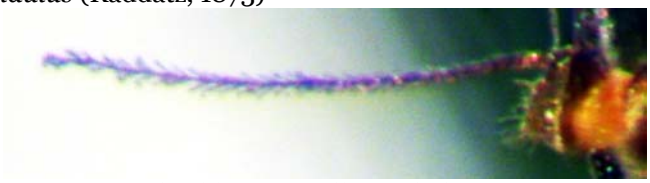
128. *Sympycnus spiculatus* Gerstäcker, 1864

129. *Syntormon zelleri* (Loew, 1850)



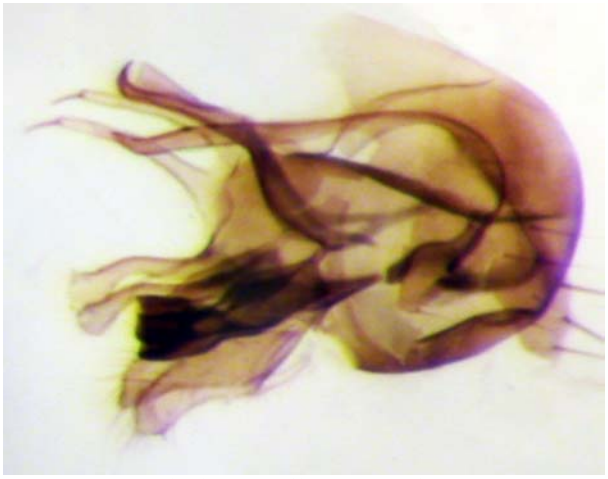
130. *Telmaturgus tumidulus* (Raddatz, 1873)

131. *Teuchophorus monacanthus* Loew, 1859

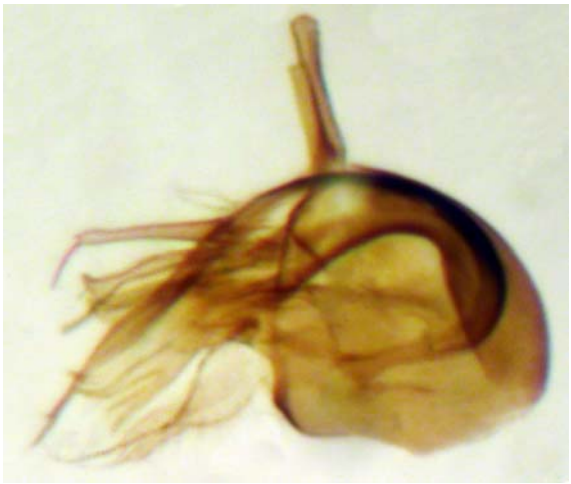


132. *Xanthochlorus tenellus* (Wiedemann, 1817)

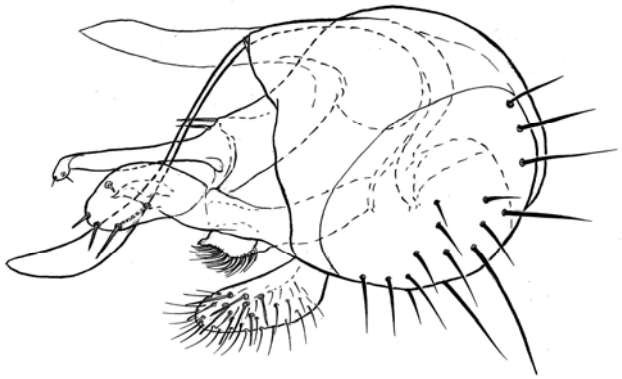
Figs. 128–132 – Antennae of some species of *Sympycninae* (128–131) and *Xanthochlorinae* (132).



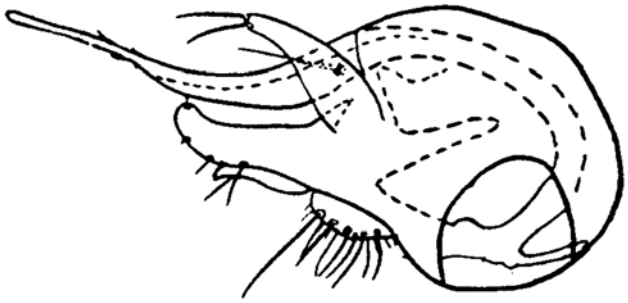
133. *Achalcus vaillanti* Brunhes, 1987



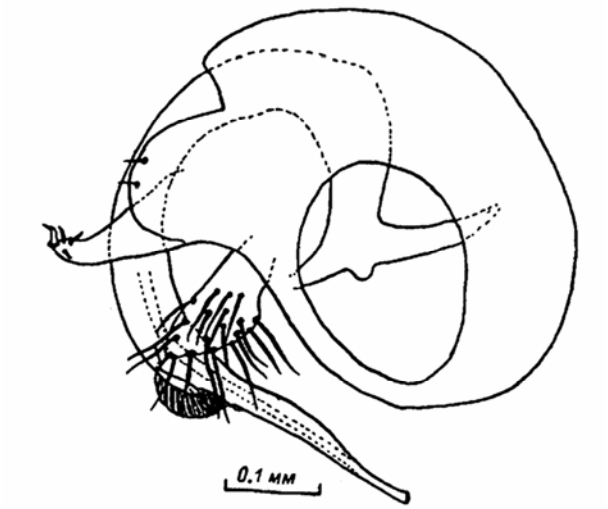
134. *Australachalcus melanotrichus* (Mik, 1878)



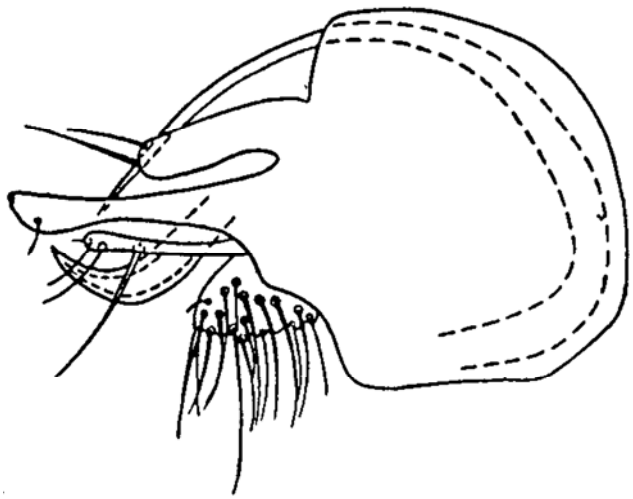
135. *Argyra xanthopyga* Negrobov et Grichanov, 2006



136. *Asyndetus izius* Negrobov, 1973

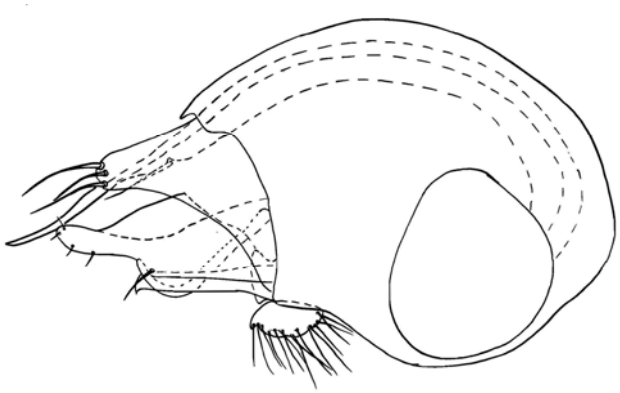


137. *Chrysotus peculiariter* Negrobov et Maslova, 2000

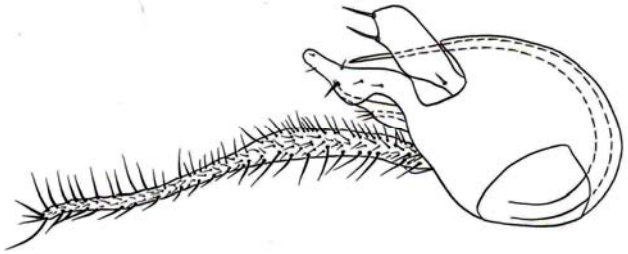


138. *Melanostolus tatianae* Negrobov, 1965

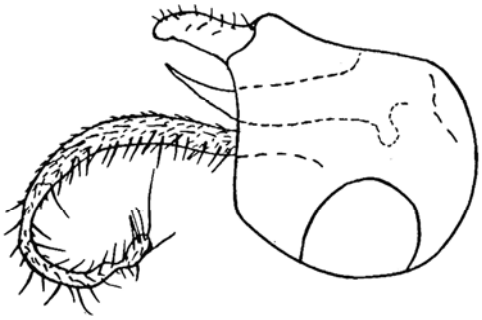
Figs. 133–138 – Hypopygiums of some species of *Achalcinae* (133–134) and *Diaphorinae* (135–138).



139. *Cryptophleps kerteszi* Lichtwardt, 1898



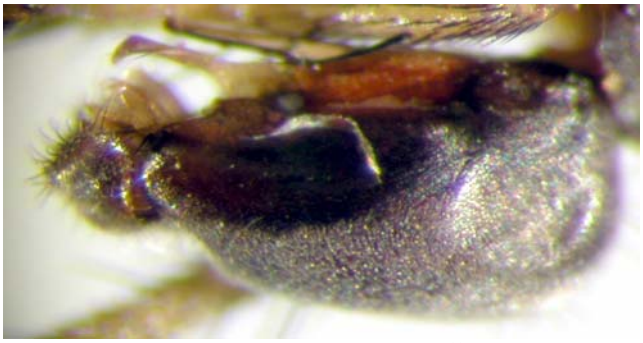
140. *Diaphorus tadzhikorum* Negrobov et Grichanov, 2005



141. *Nematoproctus daubichensis* Stackelberg et Negrobov, 1976

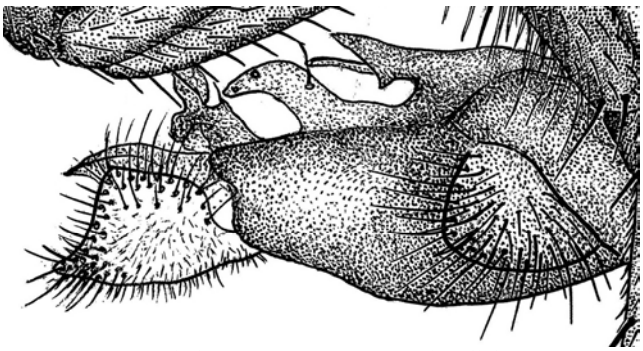
142. *Dolichopus medvedevi* Grichanov, 2009

143. *Ethiromyia chalybea* (Wiedemann, 1817)



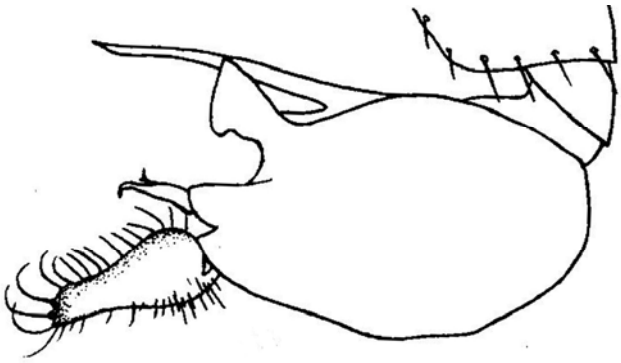
144. *Gymnopternus cupreus* (Fallen, 1823)

145. *Hercostomus phoebus* Parent, 1927

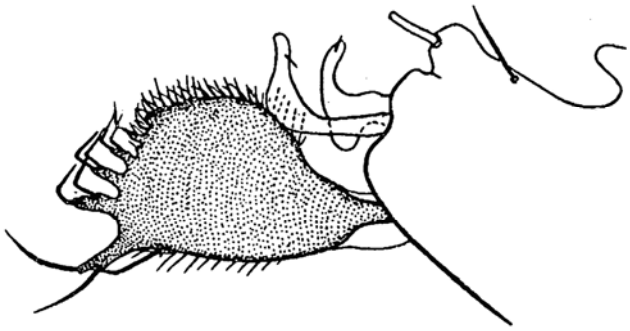


146. *Muscidideicus praetextatus* (Haliday, 1855)

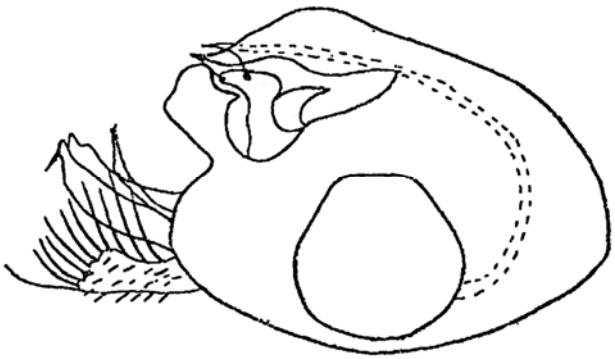
Figs. 139–146 – Hypopygiums of some species of *Diaphorinae* (139–141) and *Dolichopodinae* (142–146).



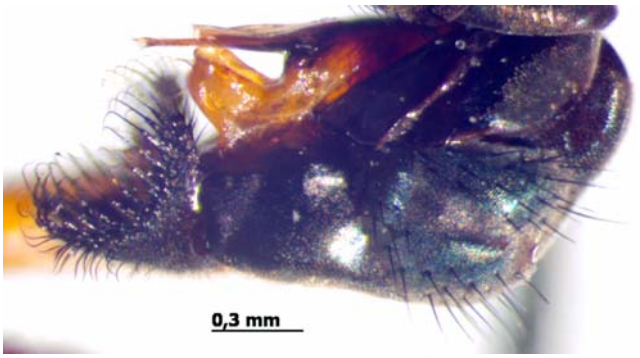
147. *Ortochile nigrocoerulea* Latreille, 1809



148. *Paraclius septentrionalis* Negrobov, 1980



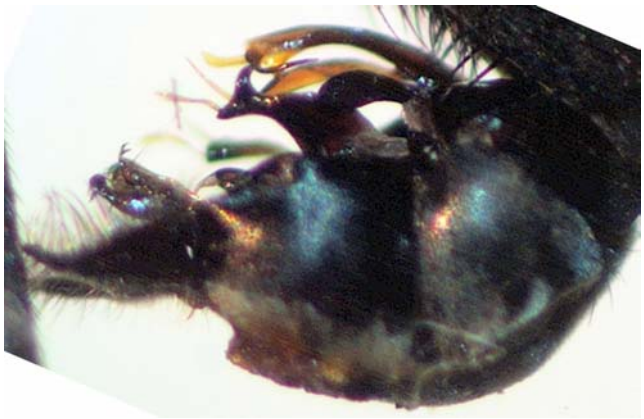
149. *Phalacrosoma zhenzhuristi* (Smirnov & Negrobov, 1979)



150. *Poecilobothrus varicoloris flavifemoratus* Grichanov et Tonguç, 2010

151. *Setihercostomus setifacies* (Stackelberg, 1933)

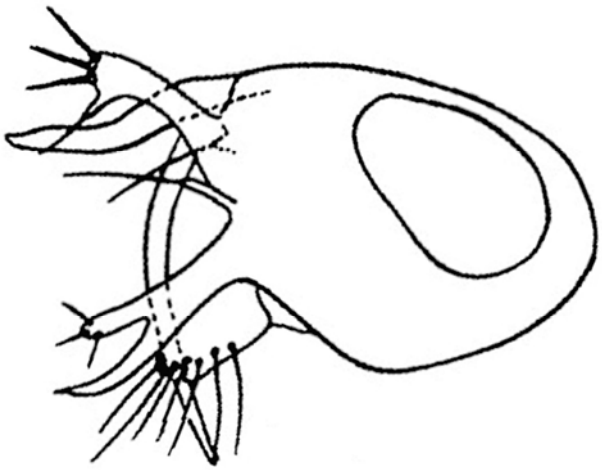
152. *Sybistroma inornata* (Loew, 1857)



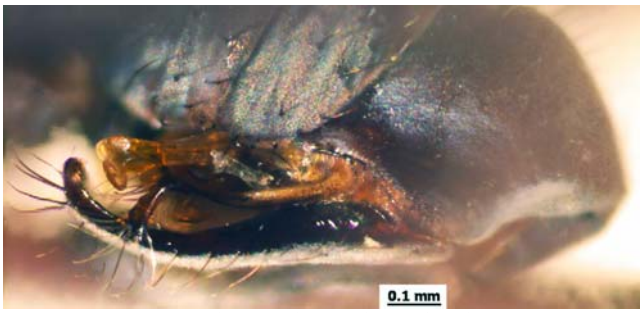
153. *Tachytrechus genualis* Loew, 1857

154. *Acymatopus minor* Takagi, 1965

Figs. 147–154 – Hypopygiums of some species of *Dolichopodinae* (147–153) and *Hydrophorinae* (154).

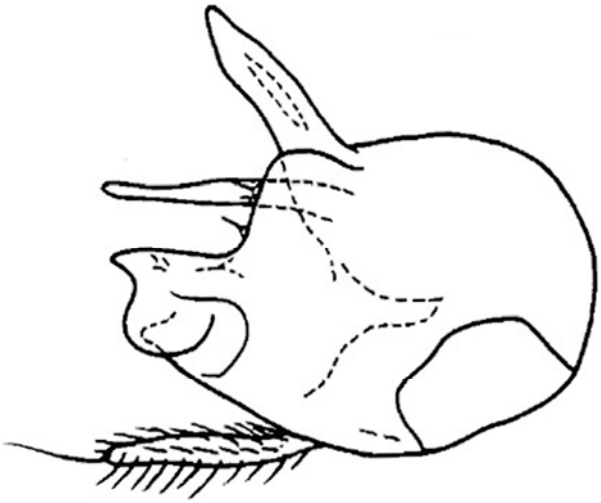


155. *Aphrosylus aculeatus* Negrobov, 1979

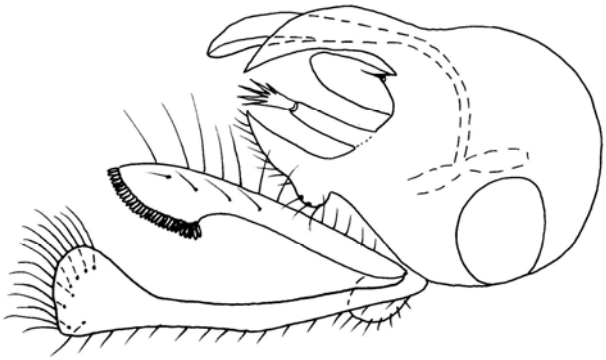


156. *Conchopus borealis* Takagi, 1965

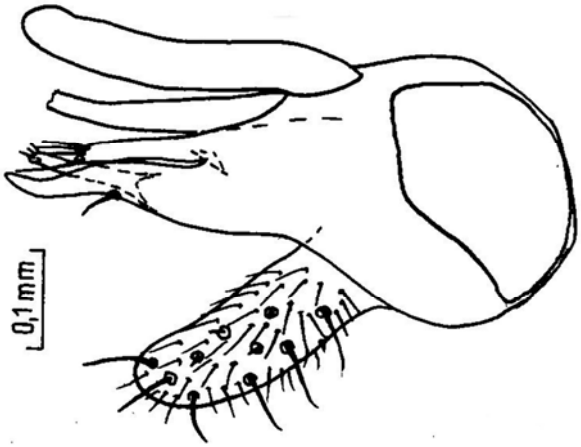
157. *Coracocephalus strobli* Mik, 1892



158. *Diostracus leucostomus* (Loew, 1861)

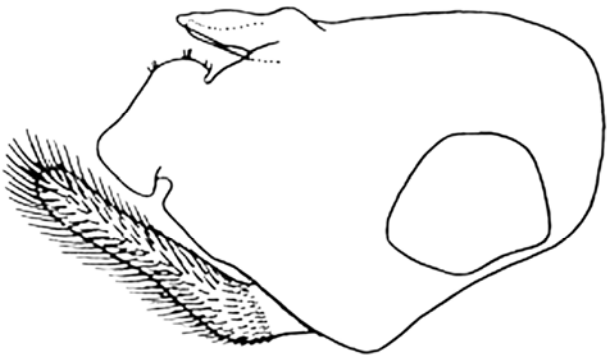


159. *Epithalassius susmani* Grichanov, 2008



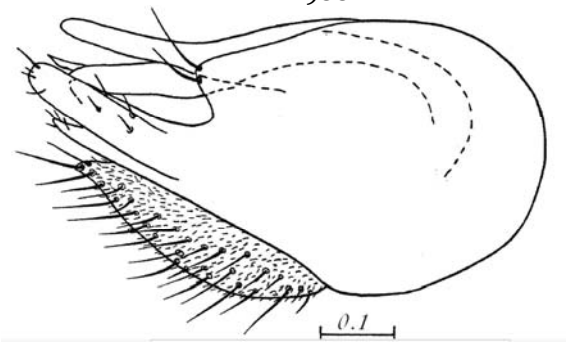
160. *Hydrophorus callostomus* Loew, 1857

Figs. 155–160 – Hypopygiums of some species of *Hydrophorinae*.

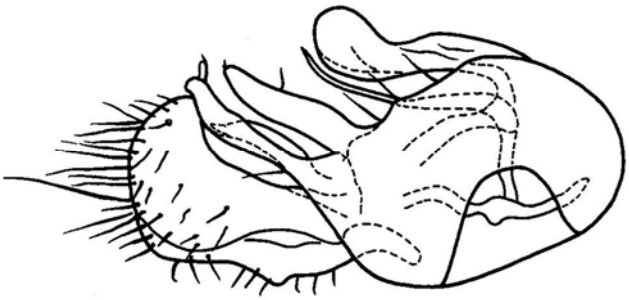


161. *Lagodechia spinulifera* (Negrobov et Zurikov, 1988

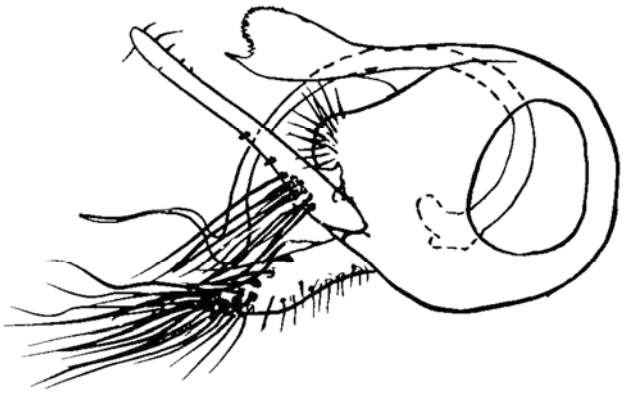
162. *Liancalus virens* (Scopoli,1763)



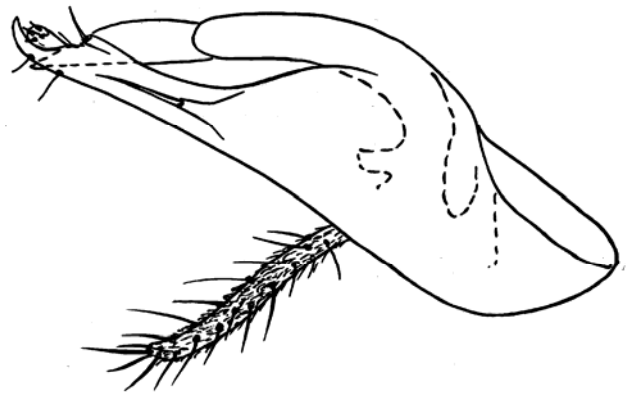
163. *Machaerium maritimae* Haliday, 1832



164. *Orthoceratium lacustre* (Scopoli, 1763)



165. *Peodes forcipatus* Loew, 1857

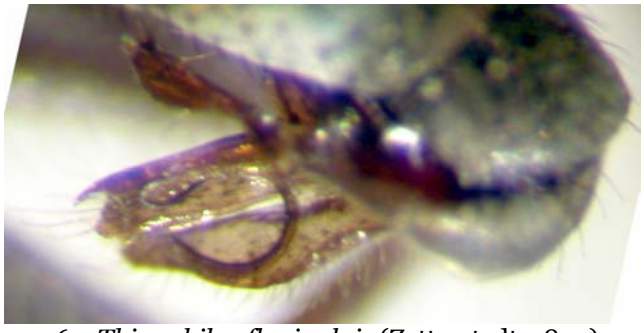


166. *Paralleloneurum cilifemoratum* Becker, 1902

167. *Scellus notatus* (Fabricius, 1781)

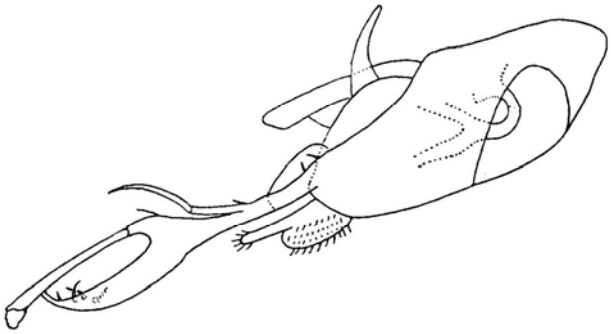
168. *Sphyrotarsus hessei* Parent, 1914

Figs. 161–168 – Hypopygiums of some species of *Hydrophorinae*.



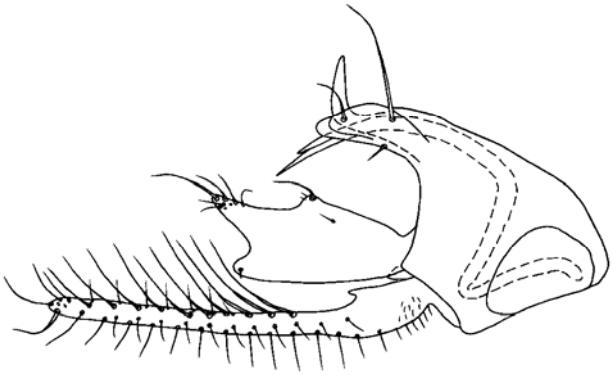
169. *Thinophilus flavipalpis* (Zetterstedt, 1843)

170. *Cyrturella albosetosa* (Strobl, 1909)

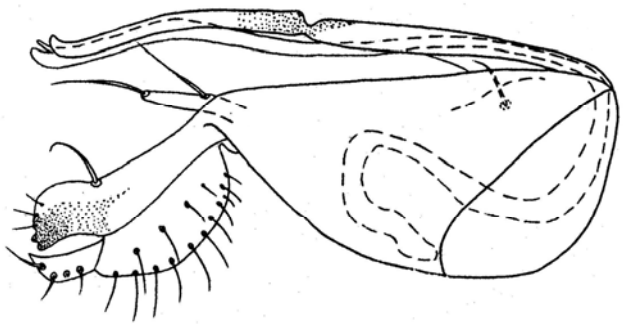


171. *Dolichophorus kerteszi* Lichtwardt, 1902

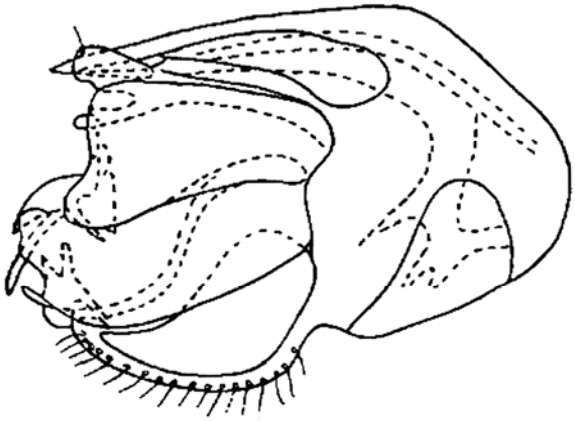
172. *Medetera sfax* Grichanov, 2010



173. *Systenus bipartitus* (Loew, 1850)



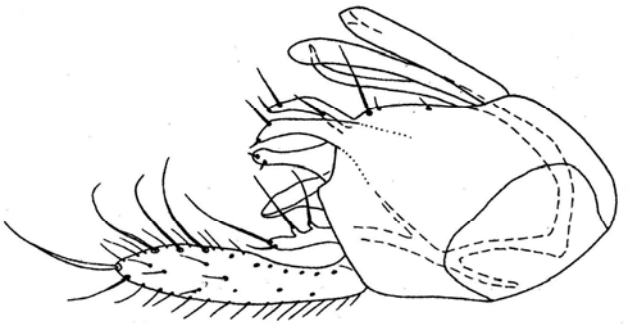
174. *Thrypticus bellus* Loew, 1869



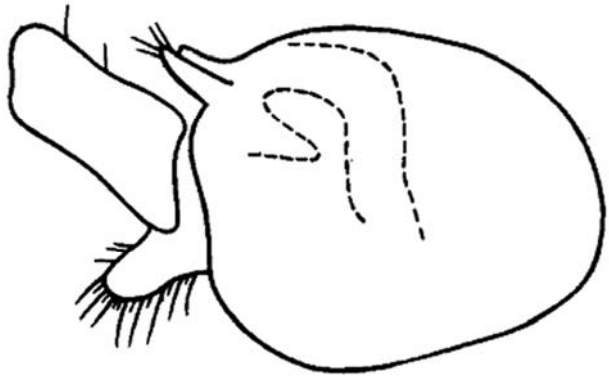
175. *Neurigona febrilata* Negrobov et Fursov, 1988

176. *Oncopygius distans* (Loew, 1857)

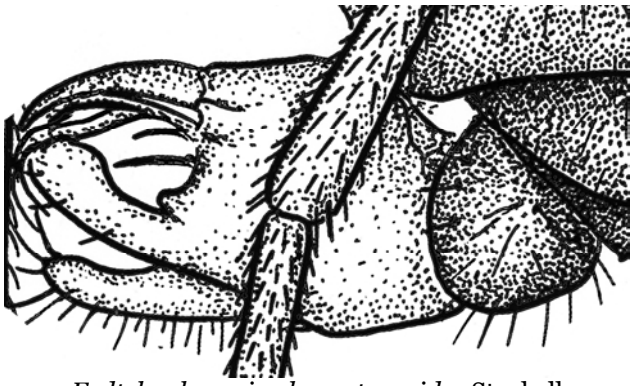
Figs. 169–176 – Hypopygiums of some species of *Hydrophorinae* (169), *Medeterinae* (170–174) and *Neurigoninae* (175–176).



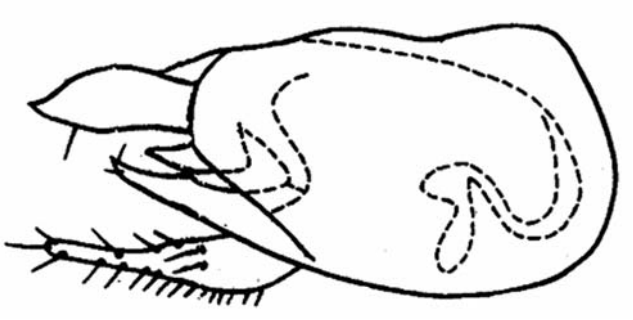
177. *Acropsilus brevitalus* (Parent, 1937)



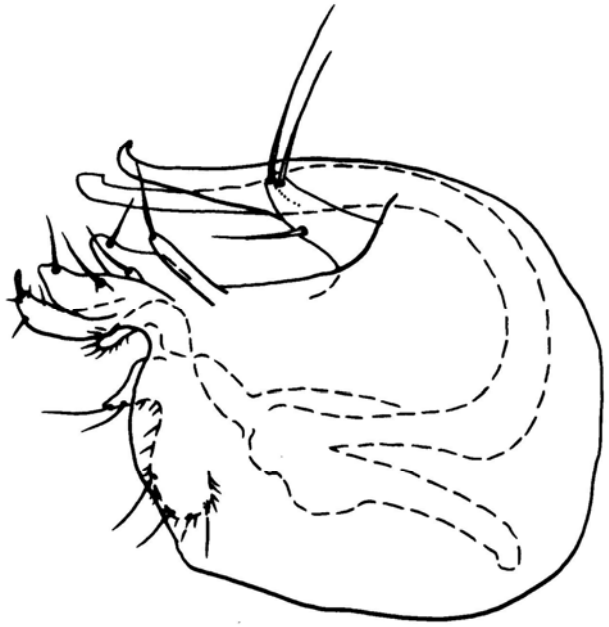
178. *Chrysotimus spinuliferus* Negrobov, 1978



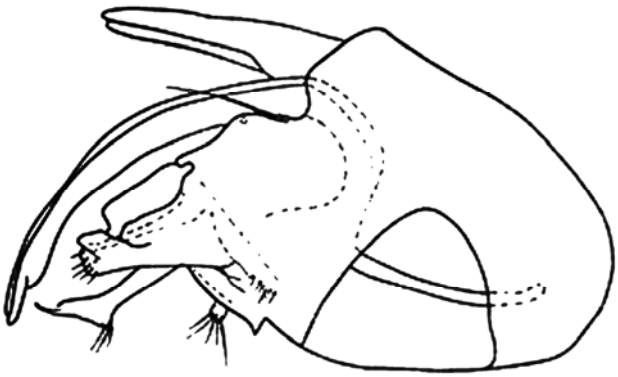
179. *Fedtshenkomyia chrysotymoides* Stackelberg, 1927



180. *Guzeriplia viridana* Negrobov, 1978

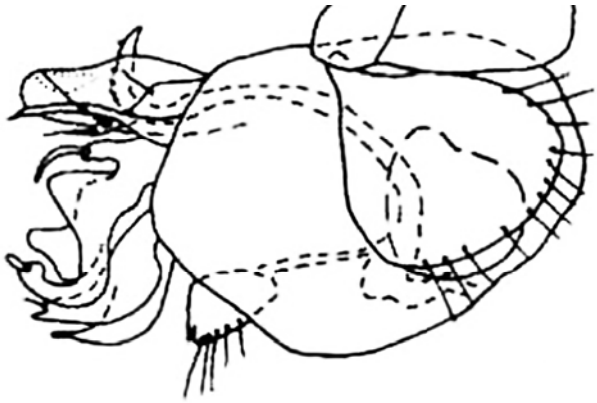


181. *Micromorphus albipes* (Zetterstedt, 1843)

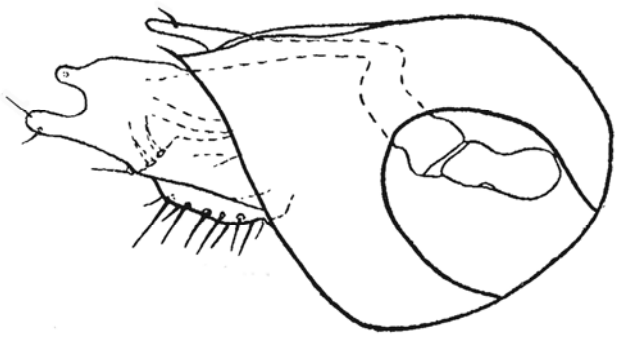


182. *Nepalomyia tatjanae* (Negrobov, 1984)

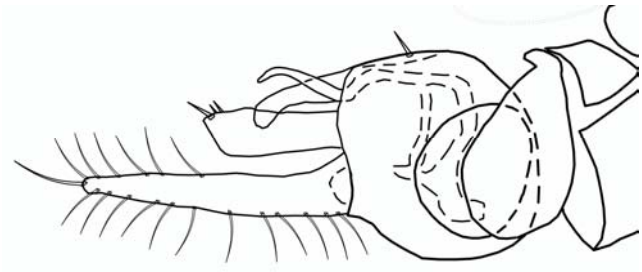
Figs. 177–182 – Hypopygiums of some species of *Peloropeodinae*.



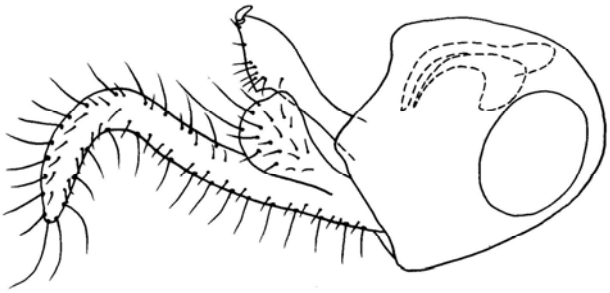
183. *Peloropeodes acuticornis* (Oldenberg, 1916)



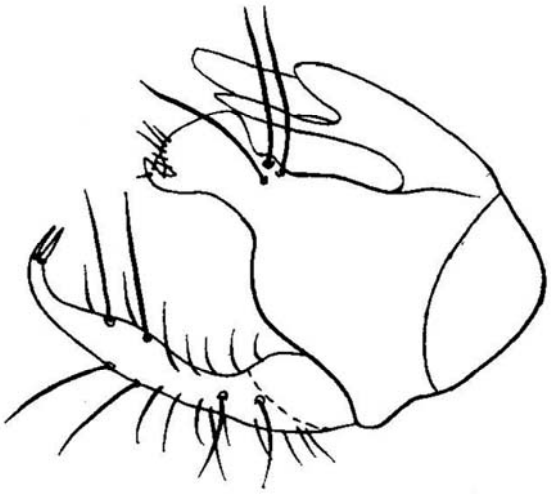
184. *Pseudoxanthochlorus micropygus* Negrobov, 1977



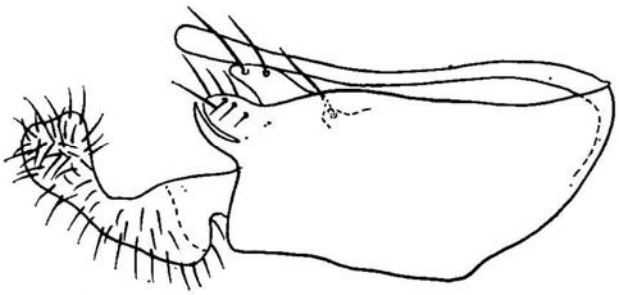
185. *Vetimicrotes baskunchakensis* Grichanov, 2011



186. *Rhaphium albomaculatum* (Becker, 1891)

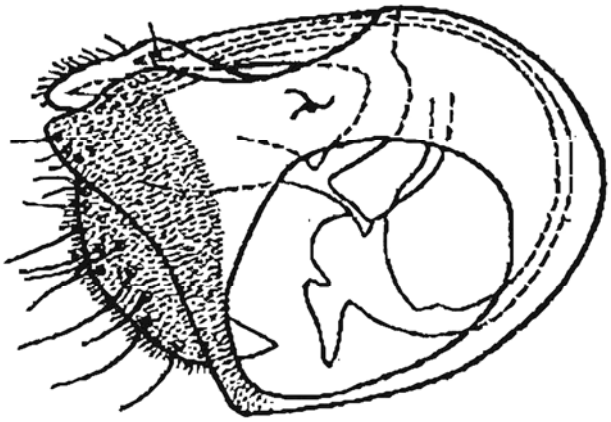


187. *Amblypsilopus janatus* (Negrobov, 1984)



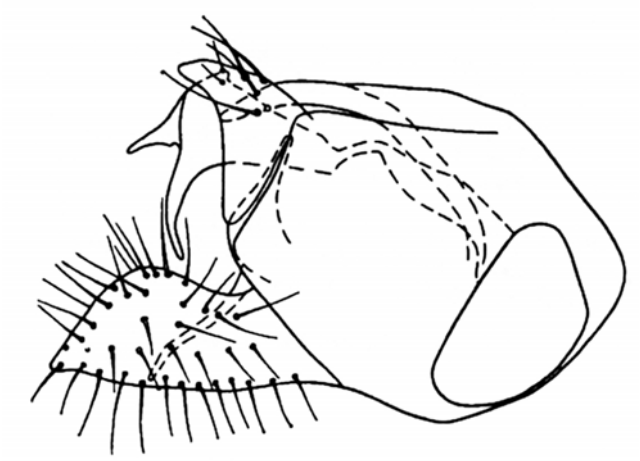
188. *Mesorhaga palaearctica* Negrobov, 1984

189. *Sciapus wiedemanni* (Fallen, 1823)

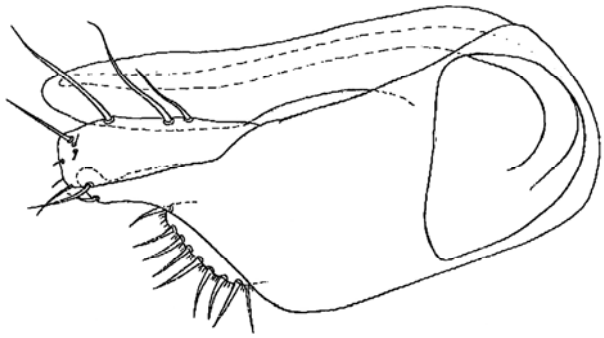


190. *Campsicnemus vtorovi* Negrobov et Zlobin, 1978

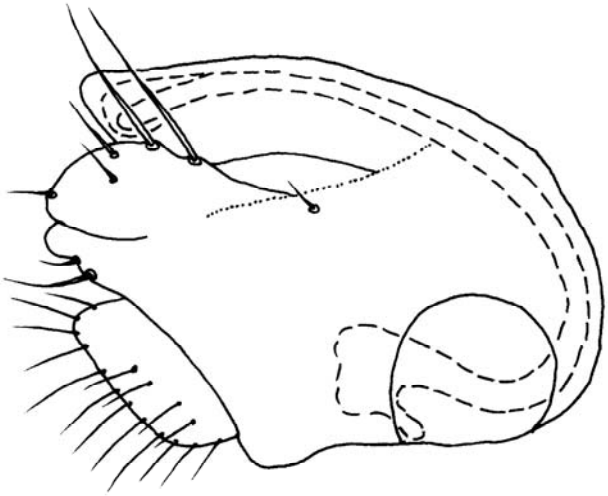
Figs. 183–190 – Hypopygiums of some species of *Peloropeodinae* (183–185), *Rhaphiinae* (186), *Sciapodinae* (187–189) and *Sympycninae* (190).



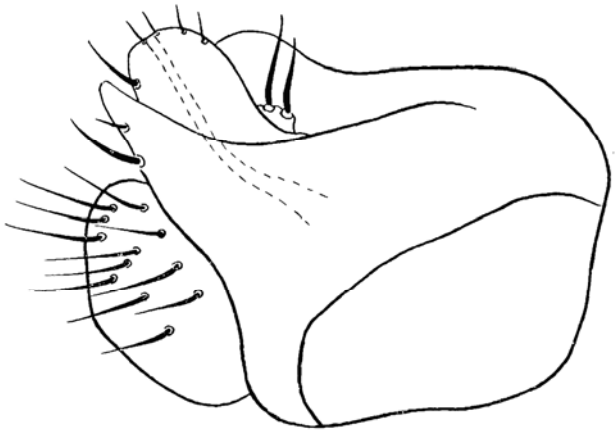
191. *Lamprochromus speciosus* (Loew, 1871)



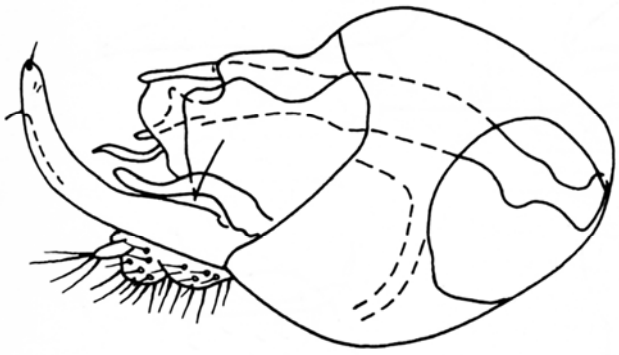
192. *Suschania stackelbergi* Negrobov, 2003



193. *Sympycnus simplicipes* Becker, 1908



194. *Syntormon latitarsis* Negrobov et Shamshev, 1984



195. *Xanthochlorus luridus* Negrobov, 1978

Figs. 191–195 – Hypopygiums of some species of *Sympycninae* (191–194) and *Xanthochlorinae* (195).

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